WESTERN STATES EDITION

DOMESTIC ENGINEERING

Whole No. 726 Chicago and New York, Saturday, November 10, 1906 Vol. XXXVII. No. 6. $1.00 a Year

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MAIN BUILDING, STATE NORMAL INDUSTRIAL COLLEGE, GREENSBORO, N. C. Hook & Rogers, Architects, Charlotte, N. C. Warmed by 100,000 square feet of AMERICAN Radiation, Rococo and School Pin patterns. Warren Webster system steam circulation, installed by B. MacKenzie, Greensboro, N. C.

AMERICAN RADIATOR COMPANY

General Offices, 282-284 Michigan Avenue, Chicago.

See Page 139 for Addresses of Sales Branches

FOR QUALITY, STRENGTH AND DURABILITY

UNITED BRASS GOODS HAVE NO EQUAL

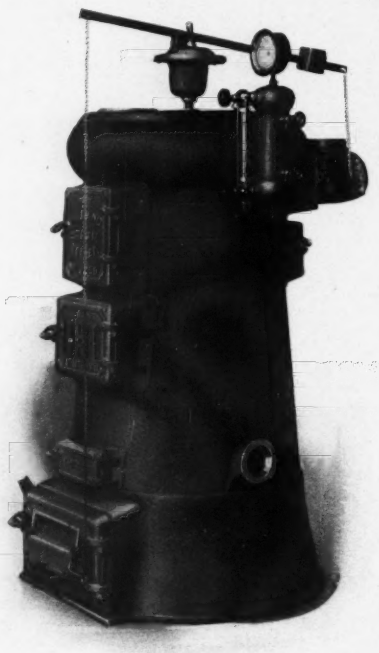
UNITED BRASS MFG. CO., CLEVELAND, O.

RELIABLE CONNECTIONS made between Lead and Iron Pipe by using the Raymond Ferrule—the only Lead Ferrule on the market which has an **extra thickness of lead over the shoulder,** giving strength where it is needed and where other lead ferrules are weak. The genuine article bears our label.

RAYMOND LEAD CO.

Crosby Spring Seat Globe and Angle Valves All Parts Interchangeable. All Parts Removable. Tested for Highest Pressures. Leak-Proof

CROSBY STEAM GAGE & VALVE CO. Boston New York Chicago



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Steam and Hot Water Boilers superlative in every respect

Fewest parts. Easiest assembled. Quickest erected. Steadiest water line. Most adaptable for all fuels. Most conservatively rated. 20 sizes steam, 225'-1,500' capacity. 20 sizes water, 375'-2,475' capacity.

Send for descriptive booklet

Holland Radiator Company

38 Dearborn Street

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PLANT AT BREMEN, IND.

TABOR MOLDING MACHINES ARE THE BEST

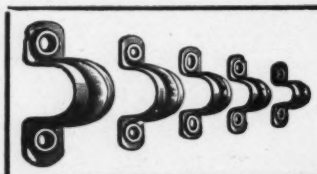
CALL OR WRITE US FOR PARTICULARS

TABOR MFG. CO., - 18th and Hamilton Streets, Philadelphia, Pa.

We make **AIR CELL** Wool Felt and Asbestos Magnesia Sectional Pipe Coverings

High Quality Low Discounts

NATIONAL AIR CELL COVERING CO., 70-78 Third St., S. Brooklyn, N.Y.



MALLEABLE AND WROUGHT PIPE HOOKS AND STRAPS

Complete stock of every size and kind. Quality the best that can be made. B. B. Ornamental Pipe Straps, all even clean cut, brightly tinned. **Ask for Catalogue and Prices.**

Berger Bros. Co., 231-237 Arch Street, Philadelphia, Pa.

REGULATORS STEAM WATER

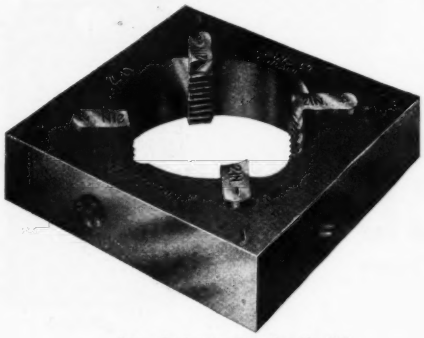
ROSS VALVE CO.

TROY, N. Y.

INDEX TO ADVERTISEMENTS ON PAGE XXIV.

Easiest Cutting Die on the Market

CRANE Perfection Pipe Dies embody an original feature of construction in that the cutters are given the necessary clearance, and their position is such that there is plenty of room for chips between the pipe and die block. Another novel feature is that the cutters are held in place by screws and can be easily taken out and renewed. It is impossible to insert the cutters so that the teeth will not track or retain perfect alignment. The cutters are made from the highest grade of steel and will outlast many times over the old style solid die.



Crane Perfection Pipe Die No. 985.

A sample Perfection Die will be sent on trial, and may be returned if not satisfactory.

These dies are unquestionably superior to others on the market, which differ little in principle of construction from the old dies of fifty years ago Comparative tests of Perfection Dies with dies made by six other manufacturers demonstrated that the Perfection required from sixty to three hundred per cent less power to thread a pipe than any other die. Perfection dies will thread pipe up to two inches in diameter. Send for circular.

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HOT WATER HEATERS, STEAM BOILERS, RADIATORS

They give complete satisfaction
Send for latest Catalogues
GURNEY HEATER MFG. CO.,
N.Y. Branch 111 Fifth Avenue, New York.
188-200 Franklin St., Cor. Pearl, BOSTON, MASS

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"Flagg" Malleable Fittings
"Flagg" Keystone Unions
THE STANDARD SOFT METAL SEAT UNION

PIPE FITTINGS AND VALVES

TRADE (S) MARK JOHN SIMMONS CO. TRADE (S) MARK

110 CENTRE STREET, WHEN WRITING MENTION DEPT. D.E, NEW YORK.

MENTION DOMESTIC ENGINEERING

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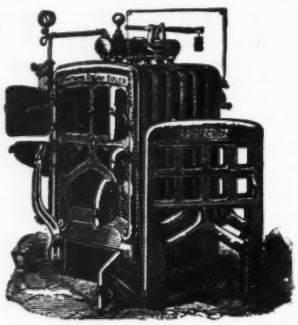
THE FIRST BEST

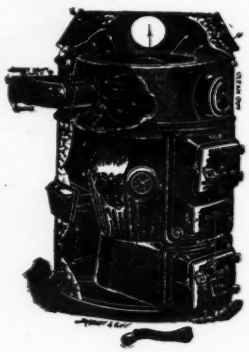
It's easy to say our hot air furnaces, steam and water heaters are the best—anyone can say that, but our record since 1849 warrants us in claiming superiority.



Steam Heater

PIONEER

THE BEST FIRST



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Great variety and large stocks to draw on.

The Boynton Furnace Co.

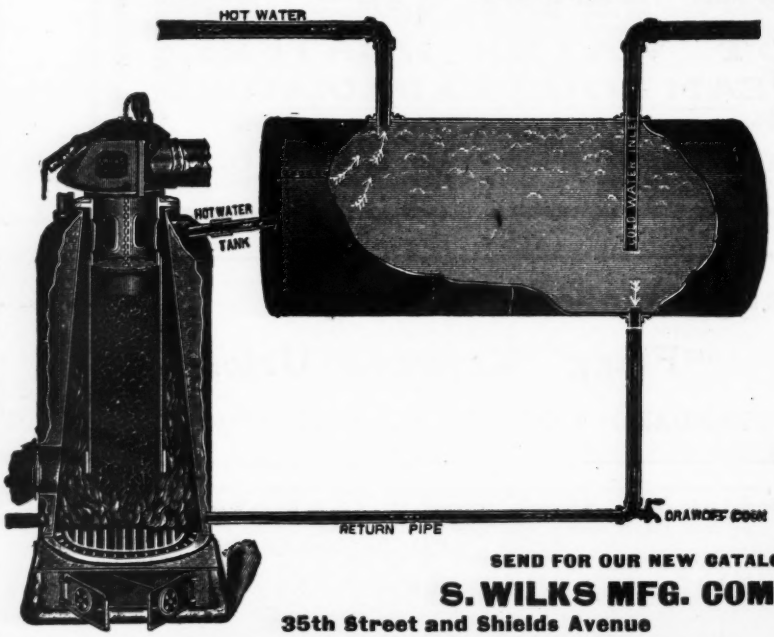
147-149 Lake Street, CHICAGO

307-309 Water Street, NEW YORK

HEATERS

ALWAYS THE BEST

WILKS HOT WATER HEATERS



For Heating Water for

Residences, Apartment buildings, Hospitals, etc.

Steel Storage Tanks

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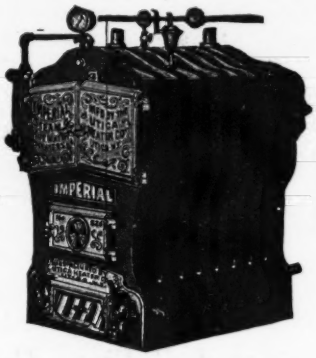
35th Street and Shields Avenue CHICAGO, ILL.

READ THE ADVERTISEMENTS

Famous Imperial Boilers

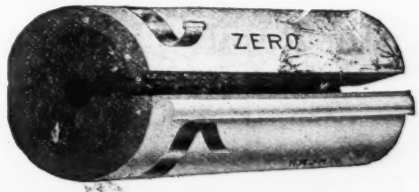


"IMPERIAL"

We want every steamfitter to have our new catalogue of Imperial Boilers—and learn all about this wonderful line of Sectional and Round Steam and Hot Water Boilers. There are no better boilers made at any price. Send for catalogue to-day.

Utica Heater Co., Utica, N. Y.

Chicago Representatives,
Chicago Heater & Supply Co., 56 and 58 Dearborn St., Chicago, Ill.



HEAT and FROST PROTECTIVE COVERINGS

"ASBESTOCEL" FOR HEATING SYSTEMS—A Pipe Covering that has no equal for its purpose. So constructed that the corrugations run around the pipe instead of lengthwise and block all air circulation making radiation impossible. Saves its cost in fuel in less than a year.

¶ ZERO PIPE COVERING prevents the freezing of cold water pipes in winter. Its peculiar construction places it in a class by itself. Made of cold insulating felts. The best covering for the purpose.

Write nearest branch for descriptive booklet

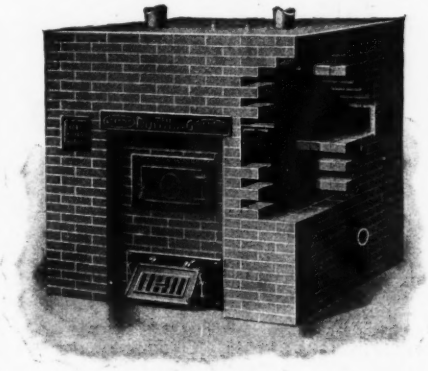
H. W. JOHNS-MANVILLE CO.

Manufacturers of Asbestos and Magnesia Products, Asbestos Roofings, Packings, Electrical Insulating Materials, "Noark" Fuse Devices, Electrical Railway Supplies, Etc.

New York	Boston	Pittsburg	New Orleans
Milwaukee	Philadelphia	Cleveland	Kansas City
Chicago	St. Louis	Minneapolis	Los Angeles
Dallas	Seattle	San Francisco	London (362)

The Dunning Boiler

is made of steel. Therein lies its intrinsic merit. No cast iron to crack or warp. Many common sense reasons in favor of the steel construction are given in our booklet. May we send it to you today.



Regular brick set hot water style

New York Central Iron Works Co.
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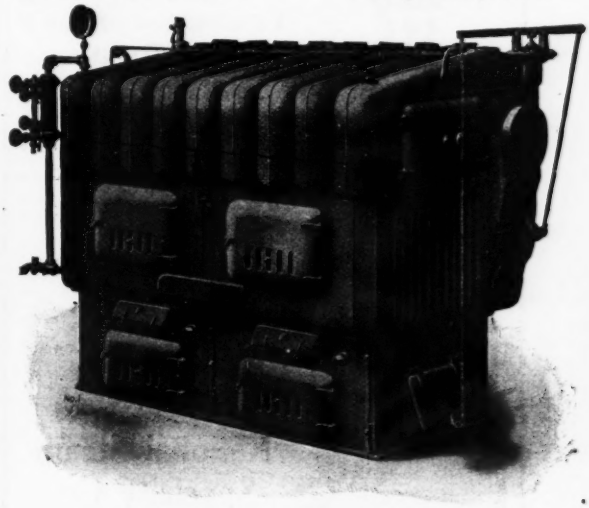
LONG FIRE TRAVEL

Means all heat units used Short grate easy to fire



THE "BERNHARD"—"BEST BOILERS BUILT". MEETING UNIVERSAL FAVOR. ASK FOR PRICES.

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Washington Office, 621—13th Street, N. W.
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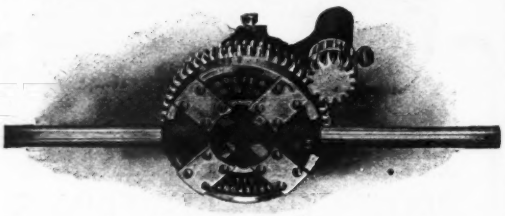
Boston Representative, The Wm. H. Gallison Co., 36 Oliver Street
Philadelphia Office, Builders' Exchange.

MENTION DOMESTIC ENGINEERING

Better Results, Less Labor



HOEFER

Adjustable Pipe Threading Machine

Made in three sizes

ONE MAN EASILY WORKS IT.

Will cut pipe to a standard taper. Will cut over and under standard sizes. Will cut a running as well as a taper thread. Will cut all sizes of pipe with one set of dies. No changing of dies. No losing of dies. Will cut nipples.

Send for Folder

HOEFER MFG. CO.

FREEPORT, ILLINOIS

This is our No. 1 Machine. Capacity from 1 to 2 inches inclusive.

The "Toledo" Pipe Threader

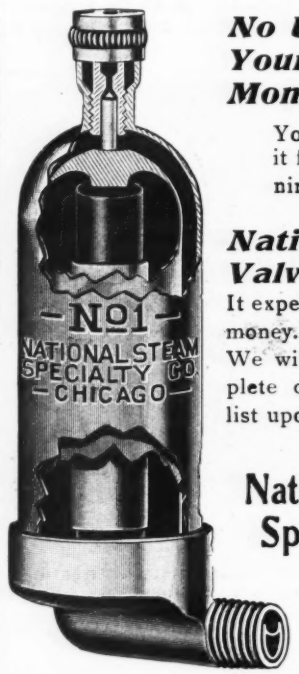
IS DIFFERENT

ONE MAN can EASILY thread any size the tool will take. And they don't cost much. Ask your jobber about it.

Send for descriptive catalogue to

The Toledo Pipe Threading Machine Co.

TOLEDO, OHIO, U. S. A.



No Use Blowing Your Customer's Money Away.

You will have more of it for yourself by winning his favor with the

National Air Valve

It expels the air and saves money.

We will send you a complete catalogue and price list upon request.

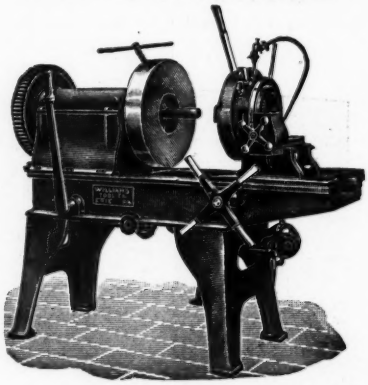
National Steam Specialty Co.

230 E. Washington St.

CHICAGO

Williams Tool Co.

Williams No. 3 Pipe Machine



Is a strong substantial tool that will cut and thread pipe from 1½ inches to 6 inches. It is a rapid worker, is equipped with Quick Opening Adjustable Dies and has six changes of speed without removing or replacing gear. *Send for Circulars and Prices.* We build Pipe Machines cutting from ¼ to 12 inches.

ERIE, PENN.

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The IDEAL Wrench

Six Points Why

1. A double set of biting jaws, the outer for pipe, the **inner for fittings, valves, flanges, and any kind of odd castings.**
2. A recess between chain support and jaws enables operator to take up all slack of chain and obtain grip anywhere on surface of jaws.
3. Ease of repair of chain. Simply remove a steel pin, discard broken links and re-attach rest of chain.
4. Automatic chain lock. A pull of chain causes it to drop into lock with all slack taken up.
5. Exchangeability of parts with mechanism concentrated in jaws. Jaws can be fitted to any bar or old discarded wrench handle.
6. NO WEAK PARTS. *Absolutely Guaranteed.*

Handled by All Jobbers. Manufactured by

KROESCHELL BROS. CO.
47 E. Erie St. Chicago

DID IT NEVER OCCUR TO YOU

in reading these advertisements that either I am one of those "things which are born every minute" or else the NYE DIE must be infinitely better than any other Die on the market? —I STAND PREPARED TO PROVE THAT THE NYE DIE WILL CUT EASIER THAN ANY OTHER PIPE DIE ON THE MARKET AND WILL LAST TWICE AS LONG.

The NYE DIE costs more than other Solid DIES—certainly.—For the selfsame reason that an automobile costs more than a goatcart.

Here is a solid die requiring no adjusting, ANY FOOL CAN OPERATE IT AND NO FOOL CAN HURT IT.

It is made exclusively from the very highest grade of English Tool Steel obtainable—EVERY ONE ABSOLUTELY GUARANTEED, HAND MADE, TOO.

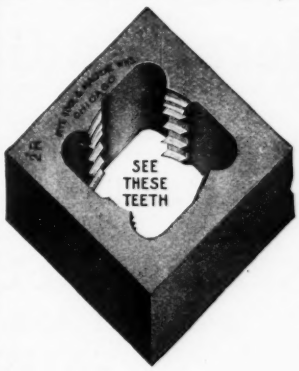
I do not attempt to cheapen my Die by inserting chasers of high grade steel into a cheap block of iron, The NYE DIE is made from one solid block of the highest grade of tool steel and can easily be reground.

I will furnish you one of my Dies free for ten days and invite you to TEST IT AGAINST ANY PIPE DIE MADE.

I contend that the cost of the time which even the cheapest workman in your establishment loses in working with poor tools amounts to many times the difference between the cost of the NYE DIE and the next best. I contend furthermore that 75% of the value of your labor is represented in the quality of the tools you use. Therefore, is it economy to buy cheap tools?

To prove that I am right I invite you to put a NYE DIE in actual work against any other pipe-threading Die on the market and if the tool doesn't actually save you 50% of your labor cost and do better work, then I will take the Die back. Send me a trial order today.

"NYE"



Nye Tool & Machine Works

196-198 S. Clinton St.
CHICAGO

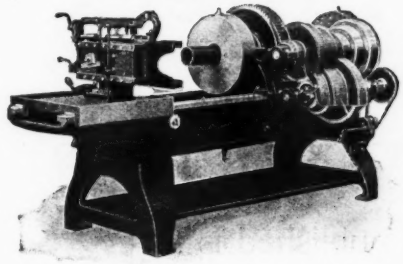
Please send me one _____inch Nye Die for trial. Unless I find it saves both time and money I will return it within ten days at your expense.

Name_____

P. O._____

State_____

WE WANT YOU FOR A CUSTOMER



No lengthy argument is necessary if you want the machine that will do the most work and the best work too, at the least cost.

If your dealer will not supply you please don't take a substitute, but order from us direct. Our descriptive booklet sent free upon receipt of your request on Postal.

The Borden Co., Warren, O., U. S. A.

803 Flatiron Building, New York

I. E. Shantz & Co., Berlin, Ontario, General Agents for Canada.

District Steam Heating as an Investment
Improved Holly System, Direct and Exhaust

AS AN INVESTMENT, district steam heating presents a splendid opportunity. Facts financially will bear out this assertion. In a few cases where plants have not attained a marked degree of success the principal underlying causes have been a lack of proper management, proper methods of charging and imperfect or experimental construction. Heat is a prime, indispensible necessity in domestic and public life and is always certain of a market, even more so than Gas, Electric Light or Water. Most buildings pay more for heat per year than for all the other commodities combined. With those interested at all in this subject we invite correspondence. Our new sixty page booklet is an interesting treatise. Free to you for the asking.

American District Steam Company

Main Office: LOCKPORT, N. Y. **Western Office: Monadnock Bldg., CHICAGO**

"Facts For Fitters"

THE MOST COMPLETE CATALOGUE OF

Boilers, Radiation, Supplies

and general information ever published is now ready for mailing to those who write for it.

THE J. H. McLAIN COMPANY

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CANTON, OHIO

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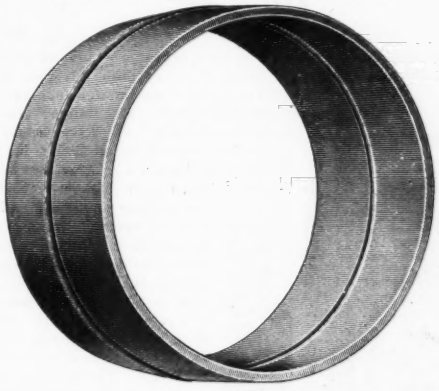
Samples Free

to those who are interested in testing the best methods of connecting Radiation and Heating Boilers.



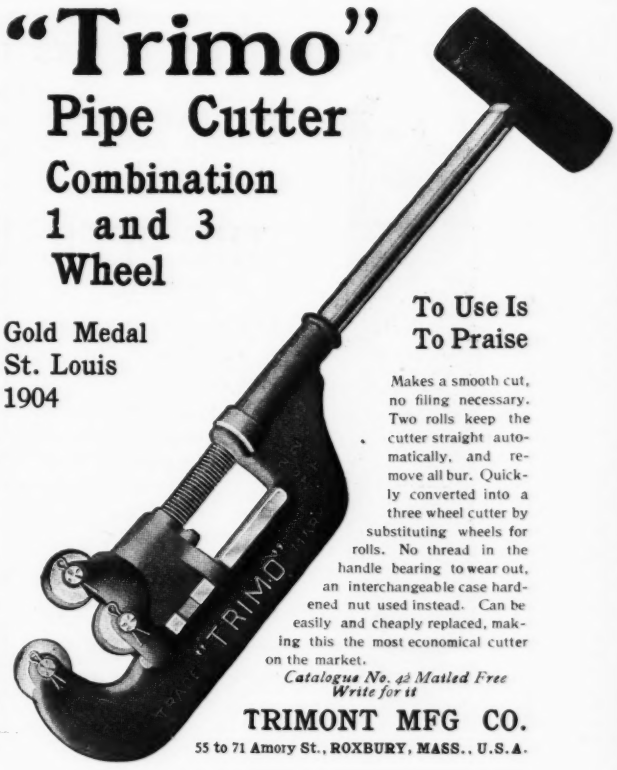
Zinc Coated Steel Slip Nipples are Rust-proof; impervious to distilled water; not affected by electrolysis; all true to size; elastic and adaptable to variation in boring castings.

The Pratt Chuck Co., Frankfort, N. Y.

"Trimo" Pipe Cutter

Combination 1 and 3 Wheel

Gold Medal
St. Louis
1904



To Use Is To Praise

Makes a smooth cut, no filing necessary. Two rolls keep the cutter straight automatically, and remove all bur. Quickly converted into a three wheel cutter by substituting wheels for rolls. No thread in the handle bearing to wear out, an interchangeable case hardened nut used instead. Can be easily and cheaply replaced, making this the most economical cutter on the market.

Catalogue No. 42 Mailed Free Write for it

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55 to 71 Amory St., ROXBURY, MASS., U.S.A.

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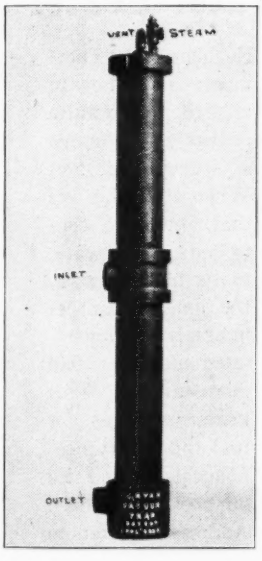
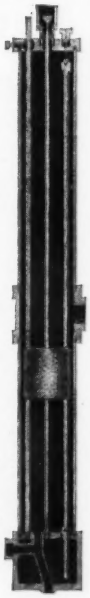


is the coming

System

I have one

that works



Write for Booklet "A"

E. J. Ryan 117 Walnut Street, Danville, Ill.

Genuine Armstrong Stocks and Dies

Light, strong, durable, adjustable. They have for years met the most rigid requirements for mechanical excellence. They can do your work better than anything else you can buy. Our latest catalogue free upon request.

THE ARMSTRONG MANUFACTURING COMPANY
284 Knowlton Street, Bridgeport, Conn.

AUXILIARY HEATING SECTION
is also in use for heater for utilizing exhaust heat of gasoline engines
Anderson-McCutchen Co., Peekskill, N. Y.

MENTION DOMESTIC ENGINEERING

Only Twenty Feet of Gas

TO HEAT A RANGE BOILER FROM TOP TO BOTTOM : : : :

THE PEER

DOES IT

Attachable to the bottom of any boiler. Let us send you our booklet and make you a proposition for exclusive agency. There is a profit in it for you.

The Peer Water Heater Co., Inc.

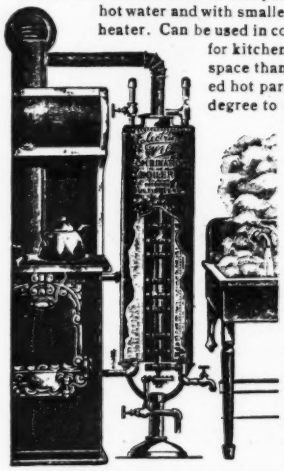
39 STATE ST., CHICAGO

Fernando W. Pripps Co., 131 Oneida St., Milwaukee, Wis. Geo. R. Ives, 423 West 7th St., Los Angeles, Cal. G. W. Burchard, 412 Main St., Kansas City, Mo.

Electric Weld Combination Boiler and Heater

(Deasy Patent)

Can be used for any purpose where it is desirable to heat water by gas, and moreover is the best for that particular purpose. It gives MORE hot water and with smaller gas consumption than any other heater. Can be used in combination with Range Water Back for kitchen installation. Takes up no more space than ordinary Range Boiler. No exposed hot parts (Note that). Does not add one degree to temperature of room. (Note this too as these points are exclusive with this heater.) No coils to clog up and renew. Complete absorption by the water of all the heat in the gas. Made in any size for basement installation, in combination with furnace and with thermostatic control. Best installation on the market for Flats or Public Buildings. Hundreds of enthusiastic users If the trade mark "Electric Weld" is not sufficient guarantee this Heater is all that s claimed, write us for PROOF. It **will pay you Mr. Plumber to know more of this—your customers will thank you** Handled by Jobbers of Plumbing Supplies. Made in sizes from 30 gallons to 250 gallons.



JOHN WOOD MFG. CO., Conshohocken Pa.

PITTSBURGH VALVE & FITTINGS CO.

Manufactures and carries in stock a complete line of the following:

Standard Screwed Fittings
Standard Flanged Fittings
Extra Heavy Screwed Fittings
Extra Heavy Flanged Fittings
Long Turn Screwed Fittings
Long Turn Flanged Fittings
Recessed Drainage Fittings
Malleable Iron Fittings
Iron Body Gate Valves
Iron Body Blow-Off Valves
Brass Wedge Gate Valves
Expansion Joints
Steam Traps
Pipe Hangers

WORKS, BARBERTON, OHIO

Address all communications to General Office, Frick Bldg.

PITTSBURGH, PA.

THE FAMOUS NIAGARA Automatic Water Heater

Regulated by a Thermostat so as not to raise the temperature of the water above a specified degree. When other heaters that cannot be controlled send the water to the boiling point, the lime and other minerals are precipitated and form a bad incrustation. This heater uses gas for fuel and is very economical. Send for our booklet. It is free. Address all letters to

Hammond-Homberger Co.

SILVER CREEK, N. Y

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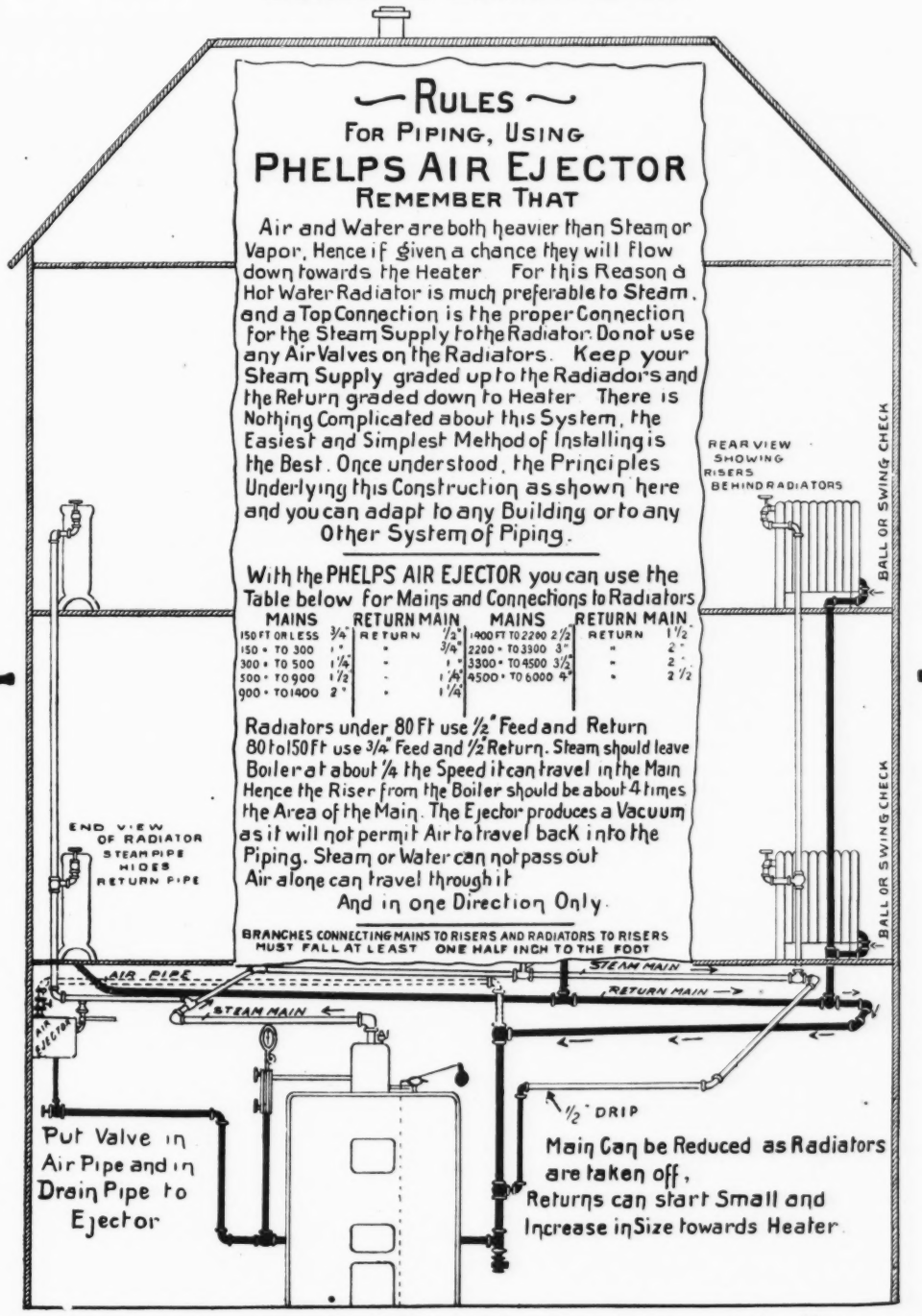
Rules
For Piping, Using
PHELPS AIR EJECTOR
Remember That
Air and Water are both heavier than Steam or Vapor, Hence if given a chance they will flow down towards the Heater For this Reason a Hot Water Radiator is much preferable to Steam, and a Top Connection is the proper Connection for the Steam Supply to the Radiator. Do not use any Air Valves on the Radiators. Keep your Steam Supply graded up to the Radiadors and the Return graded down to Heater There is Nothing Complicated about this System, the Easiest and Simplest Method of Installing is the Best. Once understood, the Principles Underlying this Construction as shown here and you can adapt to any Building or to any Other System of Piping.
With the PHELPS AIR EJECTOR you can use the Table below for Mains and Connections to Radiators
MAINS | RETURN MAIN | MAINS | RETURN MAIN
150 FT OR LESS 3/4" RETURN 1/2" | 1900 FT TO 2200 2 1/2" RETURN 1 1/2"
150 • TO 300 1" " 3/4" | 2200 • TO 3300 3" " 2"
300 • TO 500 1 1/4" " 1" | 3300 • TO 4500 3 1/2" " 2"
500 • TO 900 1 1/2" " 1 1/4" | 4500 • TO 6000 4" " 2 1/2"
900 • TO 1400 2" " 1 1/4"
Radiators under 80 Ft use 1/2" Feed and Return
80 to 150 Ft use 3/4" Feed and 1/2 Return. Steam should leave Boiler at about 1/4 the Speed it can travel in the Main Hence the Riser from the Boiler should be about 4 times the Area of the Main. The Ejector produces a Vacuum as it will not permit Air to travel back into the Piping. Steam or Water can not pass out Air alone can travel through it
And in one Direction Only.
BRANCHES CONNECTING MAINS TO RISERS AND RADIATORS TO RISERS MUST FALL AT LEAST ONE HALF INCH TO THE FOOT
REAR VIEW SHOWING RISERS BEHIND RADIATORS
BALL OR SWING CHECK
BALL OR SWING CHECK
END VIEW OF RADIATOR STEAM PIPE HIDES RETURN PIPE
AIR PIPE
STEAM MAIN
RETURN MAIN
STEAM MAIN
AIR EJECTOR
1/2" DRIP
Put Valve in Air Pipe and in Drain Pipe to Ejector
Main Can be Reduced as Radiators are taken off, Returns can start Small and Increase in Size towards Heater

An Entirely New Heating Principle that Saves 1/3rd all around

NO AIR VALVES NEEDED ON RADIATORS

We are pleased to answer all inquiries by letter or to send our interesting booklet on the subject.

IDEAL HEATING COMPANY, - OSKALOOSA, IOWA

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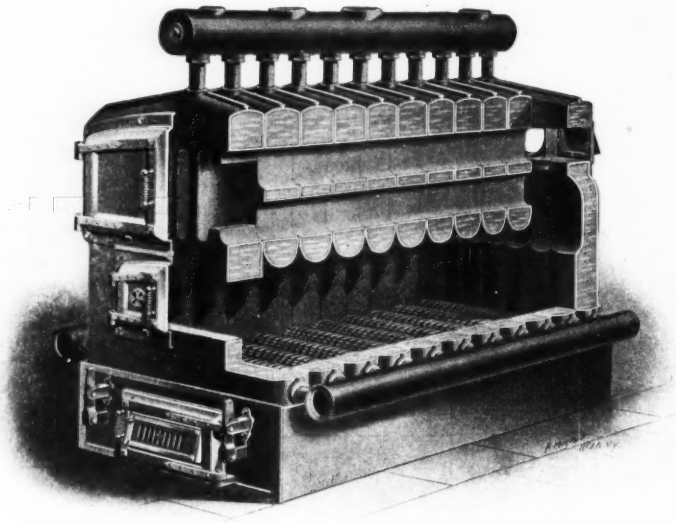
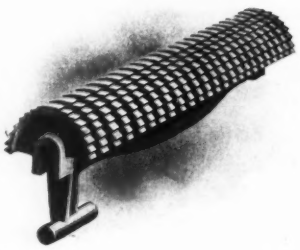
The Mercer Boiler



SECTIONAL VIEW

FOR

Steam and Water Warming



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Rotating Grate

Used in all Mercer Boilers

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WORKS
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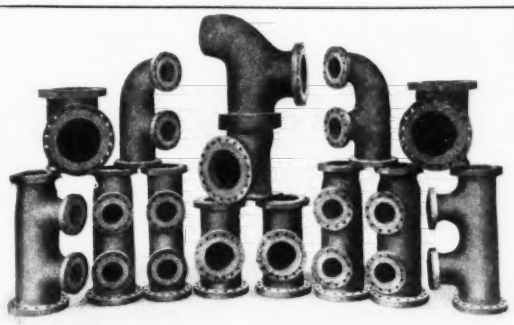
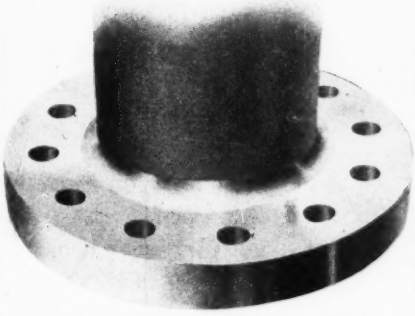
SALESROOMS
133 Centre Street, New York, N. Y.
728 Arch Street, Philadelphia, Pa.



A FEW SPECIAL BIRDSBORO FITTINGS



BALLWOOD WELDED STEEL PIPE FLANGE

JOHN E. ROLLINS & CO.

NO. 40 DEARBORN ST. Telephone Central 6928. CHICAGO, ILL.

Engineering and Steam Specialties. Wrought Pipe Valves—Fittings. Material for Power Plant Piping Equipments : : : : : : : :

STEAM PIPE EXPLOSIONS Are Impossible if You Use

BALLWOOD WELDED STEEL FLANGES that NEVER LEAK and which are 200 per cent stronger than cast iron flanges.

A BALLWOOD FLANGE has never proved defective nor leaked under working conditions. Suitable for all pressures within the limits which the pipe will stand.

BIRDSBORO OPEN HEARTH CAST STEEL FLANGED FITTINGS are 200 per cent stronger than cast iron flanged fittings. They will not burst under the highest internal pressures, nor break when subjected to the tremendous strains due to expansion and contraction, vibration, water hammer and unequal "drawing up" of the flange bolts.

DARLING EXTRA HEAVY GATE VALVES WITH CAST STEEL BODIES. These valves are of the DOUBLE DISC, PARALLEL SEAT type, and both the seats and discs can be REFACED in a common lathe by an ordinary mechanic. Owners of large isolated steam plants will no doubt appreciate a gate valve which can be REPAIRED in their own machine shop. It is impossible to reface, in a common lathe the taper seat and wedge type of gate valves without sending them to the factory where special angle plates are provided to obtain the correct taper

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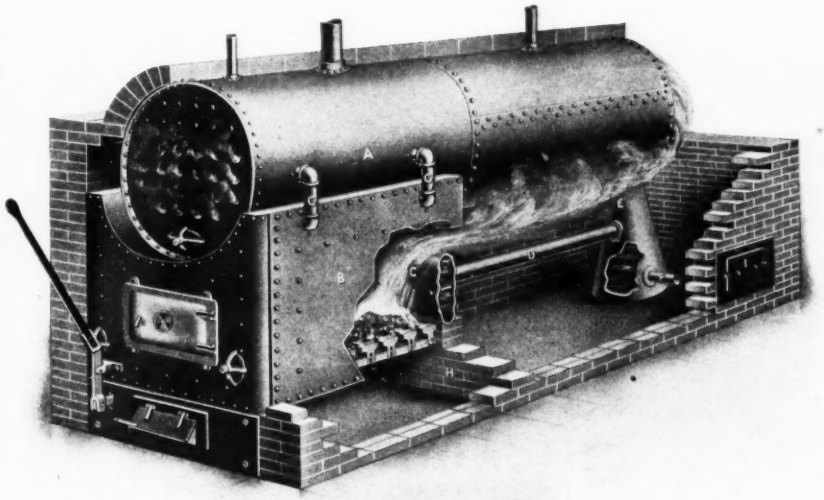

The most reliable way to heat a body of water is to place fire directly under it—not at only one side of it.

You'll agree with us after seeing the

Herbert Detachable Fire-Box Boiler

that the "old timer" fire-box was a wrong idea in a way.

The Herbert is not brainless theory: but result of 40 years individual experience of the inventor.

Our latest catalogue is not yet in your hands.

It ought to be.

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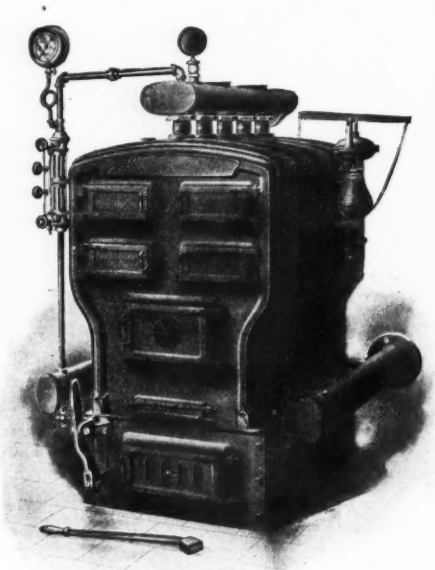
Actual Performance

ARGUMENT

Every boiler should stand or fall on the record of its actual performance, and not on what is spread broadcast in printer's ink or shouted from the housetops about it.



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For Steam and Hot Water Heating

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You are cordially invited to thoroughly inspect our boilers in actual use—we will furnish names if you like—they will need no further "boosting"—use them and be safe.

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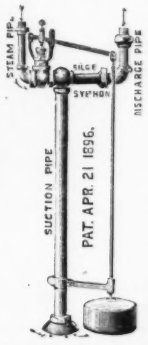
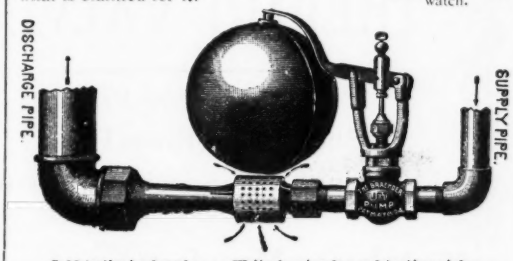
It is the best, therefore the cheapest. It is used in Municipal and U. S. Government Departments, endorsed by leading sanitary experts, and is guaranteed to do what is claimed for it.



The Braender Bilge Syphon. Always on watch.



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Not only a boiler cast in one piece but one with continuous and uninterrupted water way on the outside from base to outlet at top. That means the "Burnham" has an unequalled rapidity for circulation. Send for Catalogue.

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Cast Iron ⁘ **Malleable Iron** ⁘ **Brass**

They are
Designed Right
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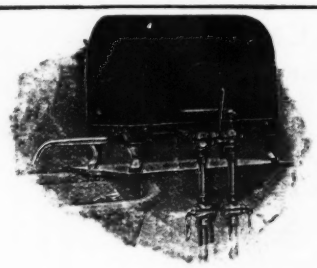

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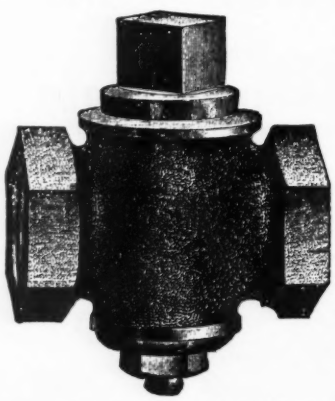
PERFECTLY GROUND



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NEAT AND STRONG
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Throws the light down where most needed

One FREDERICK INVERTED LIGHT will give more service than three regular incandescent burners

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We have positively the neatest, best finished and the best light giver on the market

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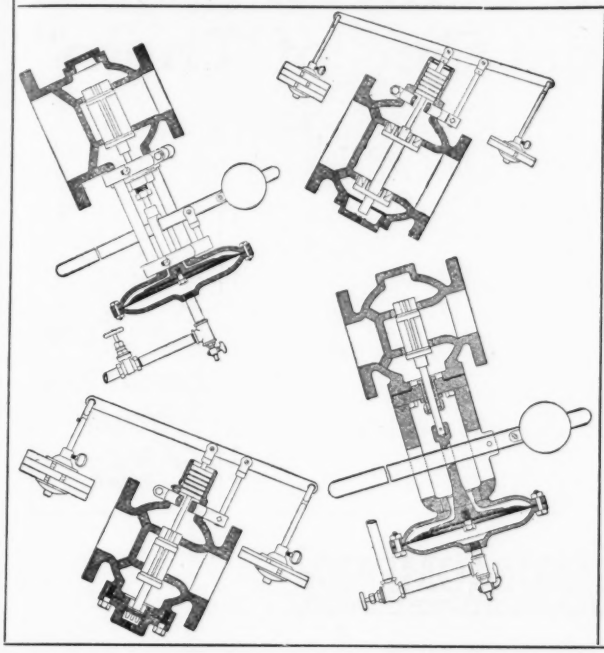

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Absolutely preventing leakage.

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The spontaneous answer to a query regarding The "Eclipse" blow-off valve, from hundreds of makers of high pressure boilers. The "Eclipse" blow-off valve cannot choke or clog, and it positively will not leak. It can be reseated under full boiler pressure, and even then it won't leak. The pressure is always against the disc and seat. Dirt is bound to trouble any ordinary valve, but not the "Eclipse".

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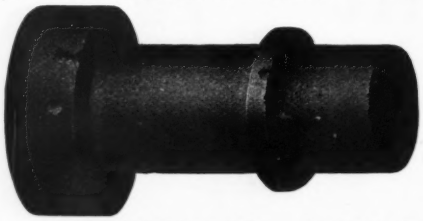

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We make a better valve for less money

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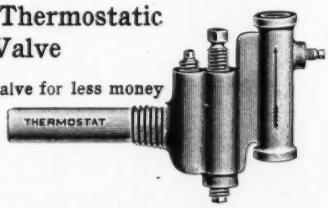

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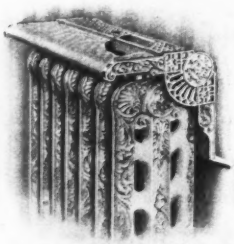

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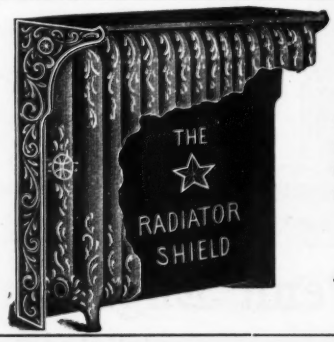

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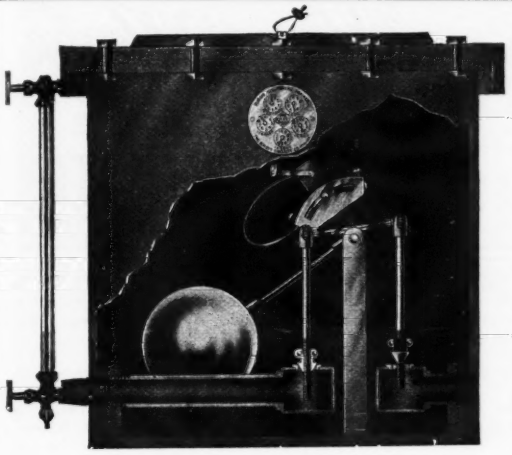

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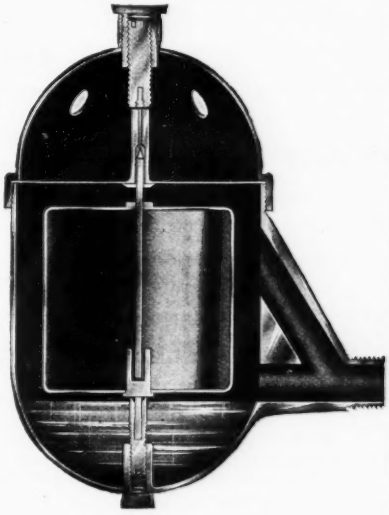

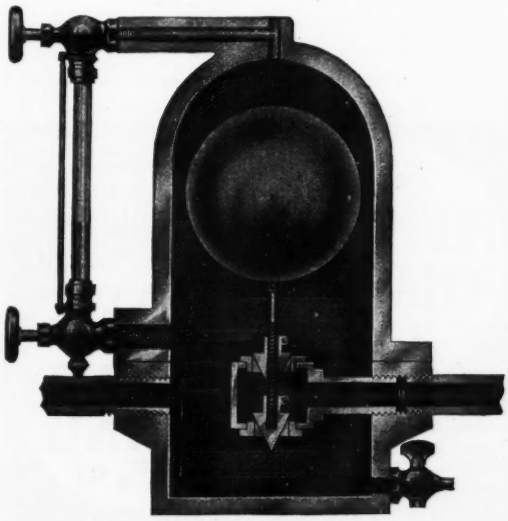

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Can be Cut to all Desired Lengths by Disconnecting the Two Lower Screws

SIZE OF PIPE	½	¾	1	1¼	1½	2	2½	3	3½	4
Adjustable Length 2 to 10 each	.18	.18	.18	.20	.22	.25	.30	.35	.37	.45
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Adjustable Length 16 to 22 each	.24	24	24	.26	28	.31	.36	.41	43	.51

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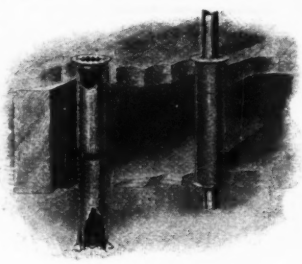

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The telescope adjustment will make it fit any floor or partition from 12 to 24 in. thick.

THEY ARE NOT EXPENSIVE.

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is the ideal Jointing Material. Is efficient, economical, permanent or temporary (as desired). No Waste. Does not make a rust joint. Unites two metals as one. Valuable for Porous Castings.

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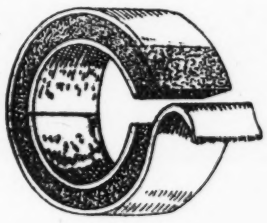

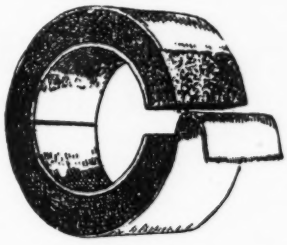

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¶ Therefore be it resolved—that the Norristown Covering Co., upon request, will furnish you, gratis, all the information you will need to do it successfully, and also will supply you with required samples free of charge. Your investment is a postal card. Will you kindly make your request today?

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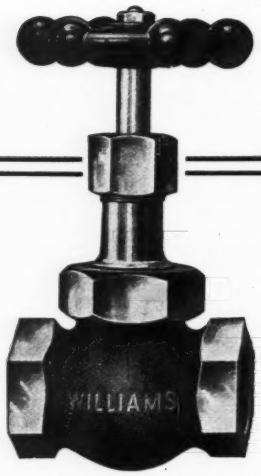

Good Experience

WE MADE and sold valves for other people for seventeen years. We are now making and selling them ourselves. We are making the best valve on earth, and "we know". Furthermore, and this is important, we know the jobber's side of the question and our policy is to make him our friend by a generous, broad business-like treatment which will please him to handle a few of our valves to start with. The valve itself will care for the future. You should have a line to show that particular customer. Write us today.

"WILLIAMS" Regrinding Valves are made in two weights classified as Medium and Extra Heavy Patterns, screwed or flanged ends. These are tested and guaranteed for 200 and 350 lbs. respectively per sq. in. By referring to the illustration it will be noticed that the valve is correctly designed and well proportioned.

The D. T. Williams Valve Co.

CINCINNATI, OHIO

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WHEN YOU HEAT WITH
THE KINNEAR RADIATOR

IN KINNEAR
Pressed Radiators

we offer the most perfect device yet invented for disseminating heat. ¶ The thinness of the walls of Kinnear Radiators *permits all the heat to come through them without waste of heat.* ¶ This, too, enables you to *control* the heat, to *regulate* it *to a nicety*, keeping the temperature where you *want* it, and insuring the *utmost economy* of fuel. A *big* radiator is an unsigh ly adjunct to a room, ornament it as you may. ¶ Kinnear Radiators occupy only *half the space* of cast iron ones and may often be placed *entirely out of sight* under a window or elsewhere. ¶ They are extremely durable, and being heavi y galvanized, inside and outside, are absolutely rust-proof. ¶ Write Dept. "3" or call at our nearest brance office and inves igate.

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Oakland, 922 Franklin St.
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San Antonio, Moore Bldg.
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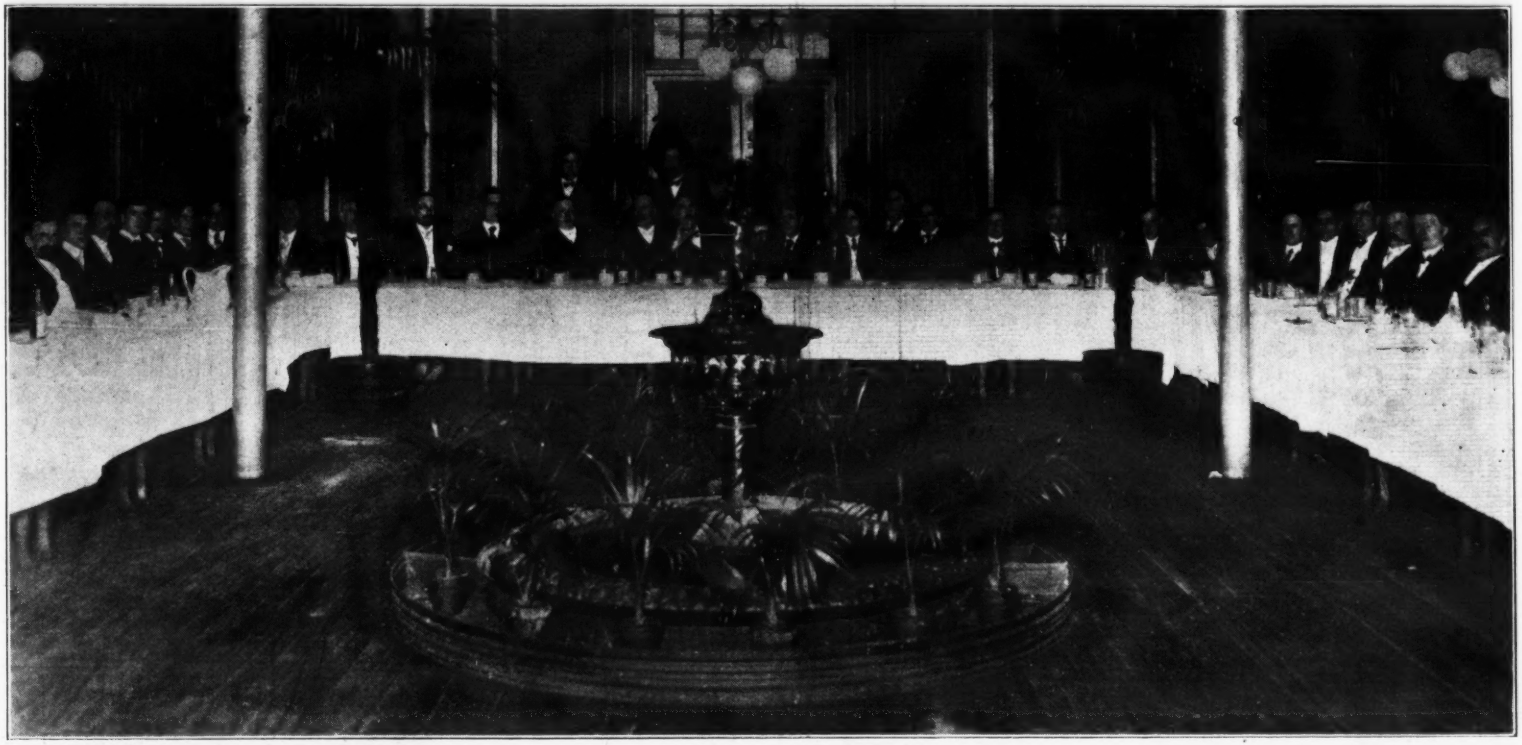

Flashlight photograph of the Nineteenth Annual Banquet of the Master Plumbers' Association of Springfield, Mass., held at the Hotel Highland, in that city, on Monday Evening, October 29, 1906

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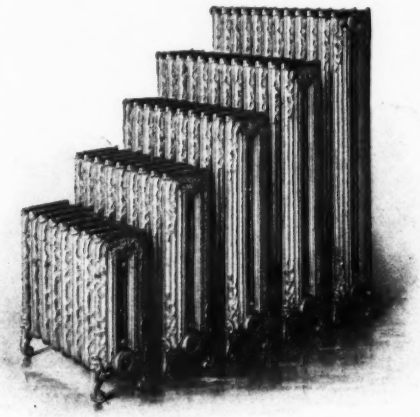

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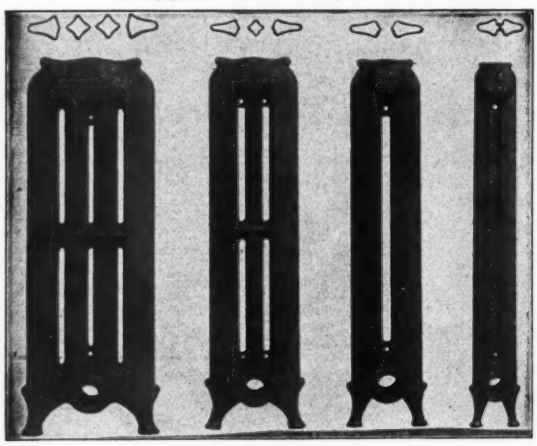

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THE TALK OF THE OFFICE

Trade with South American countries is bound to increase greatly, and manufacturers are beginning to take an interest in its development. Heretofore continental countries have dominated the trade of these South American republics, and American manufacturers have not been drawn into a serious consideration of the prospects for business in that section of the world, partly because of the poor transportation facilities, as well as the extended terms of credit required by South American merchants. The poor transportation facilities will not much longer be a stumbling block in the way of the American manufacturer. The question of credits will adjust itself, partly by the willingness of the American manufacturer to extend his terms of credit, as well as by the fact that these long credits are constantly growing shorter because of better business methods. At any rate, it is important that the manufacturers of plumbing and sanitary goods should investigate South American conditions. In order to see how little exact information exists among business men in relation to South America, suppose you ask several people in your office to give you the population of Buenos Ayres. Probably their varying statements will astonish you, when you know the city has a population of about a million.

* * *

The construction of the Panama canal by the United States Government will greatly increase the interest between the American continents, and I have been interested in looking into the economic effect which the construction of the Panama canal will have upon the development of South American republics, with particular reference to those situated on the west coast. For the facts which I shall present, I am indebted to Chas. M. Pepper, and particularly to Chapter I in his new book just published, entitled "Panama to Patagonia." The statesman of the west coast countries of South America grasps the future of the economic conditions which will be brought about by the canal, and even expresses his faith in the extravagant prophecies of Humboldt, who believed the southern continent would be the seat of future civilization, but when this will be does not seem to particularly interest him; it does not matter to him if the digging of the canal shall take fifteen or twenty years. He knows that it is to bring about a commercial evolution.

* * *

The population of Colombia, Ecuador, Peru, Chile and Bolivia approximates 11,000,000 people, who dwell chiefly along the sea coast. Mr. Pepper does not believe in the assumption made by some that only the long slope of almost continuous mountain wall from Panama to Patagonia is subject to the direct influence of the canal, and the further assumption that the Andes constitutes an impassable barrier, over which the remaining South American continental trade will be unable to pass. He states that the Andes range in places is hundreds of miles broad, and that productive plains and fertile valleys lie on the western side of the continental divide, as well as on the Atlantic slope, and that there are many places where these lofty ranges must be pierced toward the Pacific ocean. The mineral belt, containing incalculable wealth, even yet but partially exploited, depends upon the water transportation of the Pacific for its profitable operation.

* * *

As the Rocky mountains have never been able to prevent railroads from reaching to the Pacific coast, so does it seem that the Andes will not interfere permanently with the construction of railways from the eastern republics to the western. The enormous grain fields and cattle ranches of Argentine lie within less than two hundred miles of the Pacific ocean, while the pampas of the western and northwestern provinces of the Argentine republic are from five hundred to twelve hundred miles distant from the Atlantic ocean. Within a few years the agricultural population of Argentine will spread westward, up to the slope of the Andes, and long before vessels are propelled through the Panama canal the first railway to join the Atlantic and Pacific running from Buenos Ayres to Valparaiso will be completed. In the northwest portion of Argentine will be found the cities of Cordoba and Tucuman, both of which will be in communication by rail with the Pacific coast some years before the waterway is finished, so that there is an Argentine relation to the canal.

* * *

We are prepared to accept this statement, as railways are already reaching in that direction. The next suggestion is more startling; it is that as one result of the Panama canal, a portion of Amazonian commerce will flow to and from the Pacific. The first argument to bear out this assertion is the nearness of the navigable affluents of the Amazon to the Pacific coast. Steamships now go up several branches of the Amazon river to within four hundred or four hundred and twenty-five miles of the Pacific coast, while it will only be necessary to complete two hundred and twenty-five miles of difficult railway construction to open a large section of the vast Amazon region to the port of Callao.

* * *

One of the facts showing the importance of the future commerce of the upper Amazon region is that the entire

world's production of crude rubber in 1905 was but 55,000 tons. The increase in the demand for crude rubber is so great that it is readily seen that this amount is insufficient for future needs, and the increasing demand will stimulate the rubber production of an extensive region in northeast Peru. Iquitos, which is now the center of the rubber commerce of that territory, is by way of the Amazon to Para, and thence by the Atlantic ocean route to New York, 5,300 miles distant from that market, while by a river and future rail route Iquitos is 800 miles from Paita, and Paita, by way of the Panama canal, is a little less than 3,500 miles from New York, so that Iquitos is 1,300 miles nearer New York by Panama canal route than by the Amazon route; while New Orleans by the Isthmian route is within 3,300 miles of the center of the Peruvian rubber trade.

* * *

Economists maintain that it is difficult for commerce to leave established lines of transportation and for trade to be turned up stream, but a large volume of commerce will surely be drawn to the Pacific coast by the future construction of short lines of railways which, until such railways are constructed, naturally finds its way to markets through the Atlantic coast ports, and without damage to the Atlantic commerce, the Pacific coast traffic will form a larger proportion in the total of South American commerce in the future than in the past.

* * *

It is sometimes difficult to comprehend the significance of statistics, but it is perfectly true that the tariff for carrying freight must be based upon its cost. Therefore, when we present statements as to the relative distances of the regions of production from the markets of the world, as these distances will be modified by the construction of the Panama canal, we cannot fail to see that such costs must be materially reduced. For example—from Colon to New York is 1,981 miles, and to New Orleans is 1,380 miles, to which we must add 48 miles of future waterway and then make our comparisons of the ports along the coast, Guayaquill, Callao and Valparaiso, with the distance through the straits of Magellan or around Cape Horn. Valparaiso is within 5,100 miles of New York City by way of the Panama canal; by way of the straits it is 9,000 miles, and around the Horn it is farther, so that either by the straits or around the cape it is nearly twice as far by the Atlantic coast route as it will be by the Panama canal. Valparaiso via Panama is 7,600 miles from Liverpool, while around the Horn it is 9,800 miles. Hamburg will save 2,400 miles in reaching Valparaiso if its vessels go through the Panama canal, while it will save 3000 miles in reaching Callao, which is the principal Peruvian port.

* * *

It is evident that the difference in the coal bills required to carry these steamers this long additional mileage will determine the fact that when the canal is built they will go that way.

* * *

It will not be particularly interesting to give figures in detail in relation to the foreign trade of the west coast republics. It may be said, however, that while the population does not rapidly increase the consumptive capacity of the population has increased very rapidly, and it is not difficult to see that when the products of these countries are brought nearer the great world markets that their exploitation will require a larger population, and that this increased production of wealth will give the people a much larger purchasing power. Take, for example, the foreign trade of Equador, amounting to probably $19,000,000 a year at the present time; most of it flows through Guayaquil, which by way of the Panama canal is 2,864 miles from New York and 2,263 miles from New Orleans. By the Cape Horn route it is 11,470 miles to New York, so that we see that the entire foreign commerce of Ecuador in the future will pass through the Panama canal, except that portion which goes to San Francisco and beyond.

* * *

The foreign commerce of Peru is probably $40,000,000 a year, most of which now goes through the Straits of Magellan and around Cape Horn. The principal port of Peru is Callao, which is 10,700 miles from New York, measured around the cape, while by way of Panama it is but 3,600 miles. Most of the export trade of Peru is raw sugar, which when the canal is opened will be shipped through it to New Orleans, New York or Liverpool. Three hundred and sixty miles south of Callao is the port of Mollendo, through which comes the ores, metals and wools of southern Peru and Bolivia, and it is not difficult for us to assume that much of this commerce will find it profitable to take the shorter routes.

* * *

The foreign commerce of Bolivia amounts to about $18,000,000 a year, and most of it goes around the cape. A portion of it should find its way through the canal.

* * *

Chile has a foreign trade amounting to $130,000,000 a year. Not so large a portion of this foreign trade will find its way through the canal, because the saving in mileage is not so great when we compare the canal route with the Cape Horn route.

* * *

In the past the operations of the railways across the Isthmus of Panama has been entirely in the interest of the transcontinental American railways. Now that the Government of the United States is operating the railway and fair rates will be inaugurated, it is quite possible that some portion of the foreign trade of these west coast republics, which now naturally flows to European points, will be diverted to New York and New Orleans, so that the commerce between the United States and these west coast countries should constantly increase from the year 1906.

* * *

Another feature which must be considered will be the inevitably overflow of American capital and energy after they have at once become engaged in building the waterway and supplementary projects. Students of the history of the United States will remember the great impetus given to settlement of new regions by the effect of the civil war, which accustomed men to range farther from home. So it will be with the construction of the Panama canal. Capitalists and contractors engaged in the work will seek other fields and in the vast and undeveloped South American countries they will find fields for their enterprises. Coincident with the beginning of the construction of the canal by the United States, the west coast republics are entering upon definite policies of har-

bor and municipal improvements, including the construction of railways. All of this activity is very inviting to American capital and energy, and while the influence of the United States, commercially speaking, in these southern countries has been small compared with the commercial supremacy of European countries, this condition must be reversed by the operations in Panama.

Shop Talk on Brazing.

THE ANNEXED illustrations describe various forms of brazing outfits, nearly every one of which may be constructed in the shop without going to very much expense or trouble. Fig. 1 is a diagram of one of the simple forms of burners using common illuminating gas or vaporized hydrocarbons, such as petroleum, gasoline, etc. The danger that used to accompany the employment of gasoline has been partly eliminated, so that the devices using this substance for heating are safe. In the cut shown the air blast is also called into play and the air and the gases combine in the nozzle A. Hence the pipe unites at B and the discharge combines both ingredients. There is a check valve in each of the pipes, used to control the flow of the gas and the air. The mixture of the gas and air occurs at this point. A very intense heat is secured from the flame which is generated. The severity of the blast upon the work creates a complete heating very quickly. The pipes should rest in brackets. The nozzle should discharge its force into a recess formed with firebricks and the arrangement of the brick should be

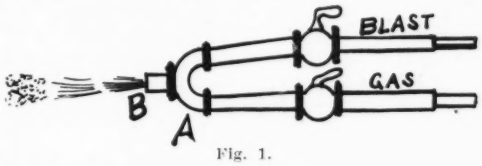


Fig. 1.

so as to concentrate and hold the flames and heat. Sometimes the oven is built of fire clay.

Not infrequently the plan of the burners is as exhibited in Fig. 2, in which there is a flame developed from the two sides. The pipes C and C, on either side, carry the gases and compressed air to the nozzles as shown. Anyone familiar with pipes and pipe fitting can readily put up one of these brazing outfits. The furnace D is formed by use of firebricks or clay, as in the first instance. Owing to the fact that there are two flames, one from each side, to direct upon the work in process of brazing, the operation is hastened and the work finished more speedily and as a rule more evenly. Then again, we may employ the four-burner form of brazing outfit, as sketched in Fig. 3. In the construction of some of the four-burner furnaces, in-

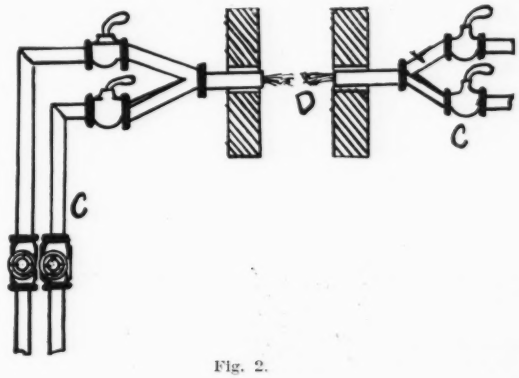


Fig. 2.

stead of making the joints of pipe square, as shown, the entire plan is shaped like a circle, so that the corners are avoided. Instead of having one square smaller than the other, many artisans erect the two feed pipes so as to have one directly above the other. However, the plan shown will answer all purposes. The main feed pipes for the air and the gas are designated at E and F. These are connected with the square forms for the distribution of the contents to the burners. The line H may carry the gas and the line G the air, or the reverse. The nozzles receive the combined gases and the force of the airblast, and the flame resulting is

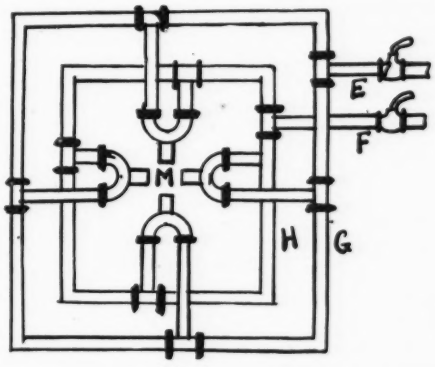


Fig. 3.

driven from four sides against the work in process. The advantage is that the flame is directed evenly on all sides of the work. Any desired temperature can be obtained very easily.

Let us look at some of the principles employed in the work of soldering the joints for brazing. In some shops the old-fashioned forge is still used for brazing and the practice is to bind the work with

wire or rivets and bury it in the fire. Perhaps some pipes or tubes are to be brazed. Then if the forge is used the workman will find it difficult to determine the temperature, as he cannot readily see the color of the metal in the fire. However, the forge is necessarily used in some shops because no other apparatus is available. The majority of shops either possess modern brazing devices or send their work out for brazing. In the heating of the joint the ends are lapped, or butted, and provided with a sleeve or bushing, or pinned. Sometimes the wire binding is used to hold the parts together until the brazing is done, as shown at N in Fig. 4.

In Fig. 5 is sketched the mode of connecting two flat pieces which are tapered down to fit snugly.

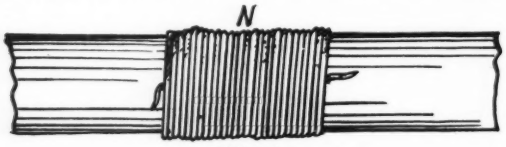


Fig. 4.

In order to retain the parts in position, either winding of wire is necessary, or better still, two holes bored through for riveting. The rivets always hold the work steadily while the brazing operation is under way. Care must be taned to get the metal thoroughly heated through. The error of finishing the work when the heavy parts of the metal are partly heated and the light parts thoroughly heated, has been the cause of many defective unions. The error is also made of not giving time for the heat to reach the interior of the metal. The application of the flux is important. Plain borax is used in nearly all shops. Borax which has been thoroughly dried and calcined is recommended. On some work the calcined kind swells and bubbles

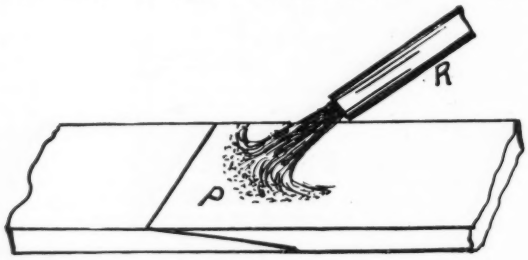


Fig. 5.

freely, and to avoid this the workman often resorts to borax which has been melted and broken into coarse powder.

The work for brazing must be well cleaned. Foreign matter should be removed. The heating will scorch off everything, as a rule, and leave a plain surface. But it is best to remove the foreign substances before heating, so as to present a clean, smooth surface for the flux. Borax will not be dissipated or thrown off by the heat if you put it on right. Both borax and solder are now put on the prepared surfaces and the flame may be directed on to the work as at P, Fig. 5, in which the nozzle is designated R.

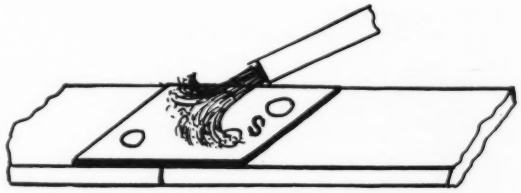


Fig. 6.

Sometimes the process of uniting the parts is effected by putting a piece of metal on, as at S, Fig. 6. In Figs. 7 and 8 we exhibit some of the finishing wheels. After the work is brazed it may be necessary to clean and smooth the parts. There may be need of a cold chisel and file to remove the heavy pieces of attached metal. After these portions are chipped or filed off the lighter grinding may follow on a scratch wheel, as in Fig. 7, or an emery wheel, as in Fig. 8. The scratch wheel is made by using a disk coated with card wire clothing purchased from manufacturers of textile card clothing. The clothing is a leather surface with steel points inserted. This clothing is cemented to the

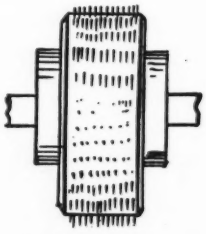


Fig. 7.

Fig. 8.

wheel surface and the wheel furnished with a shaft and turned in bearings with the scratching steel points against the work. The emery wheel can be made with a wood disk similarly fitted and furnished with an emery surface. With this wheel effective grinding can be done on rough parts of the brazed joints.

To clean window glass thoroughly pass diluted sulphuric acid, about as strong as vinegar, over it, and let it act a moment; then throw on just enough pulverized whiting to give off a hissing sound, directs the Master Painter. Rub both over the pane with the hand and polish with a dry rag. Rinse with clean water and a little alcohol, polish dry and clean.

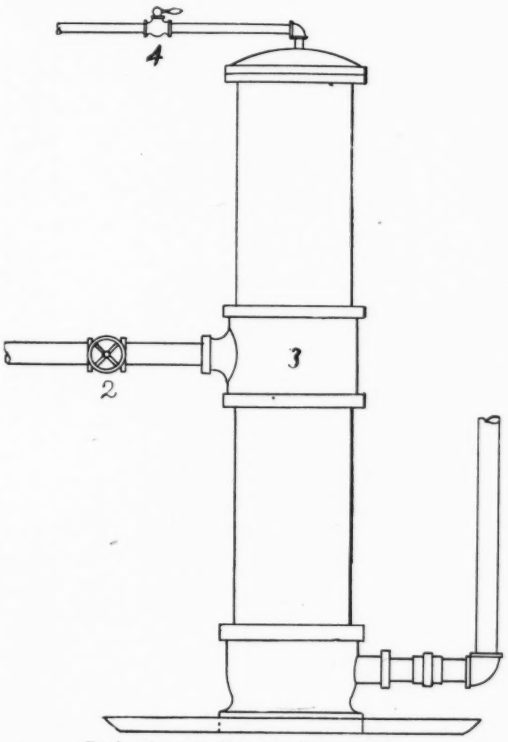
Removing Air From Water

By W. H. Wakeman

IN a certain public institution water used for various purposes contained much air, and when faucets were opened the mixture was very objectionable, as water spattered on the floors and caused trouble in other ways.

Pumps were used to give pressure required to force water to the upper floors, and as the supply was inadequate at times, air was drawn in as a natural consequence.

The illustration shows a device made to remove this air and it works well. Water and air entering



Device for removing air from water.

through the pipe 2 passes into the separator 3, which is made of 6-inch galvanized iron pipe and suitable fittings.

As air is lighter than water it comes to the top and passes out through 4, which is a 3/8-inch cock kept partially open at all times, and both air and water are discharged into a urinal. A solid body of water passes out through 5 to the lavatories, closets, sinks, etc.

Electric heaters for curling irons are needed in a modern hotel, to prevent the use of lamps and stoves by guests who must have something of the kind.

Computations for Hot Water Heating

By A. Goebel, Chief Engineer, Berlin
(Translated from "Gesundheits Ingenieur")

(Concluded.)

By laying off the values of W and l_3 in the above table on an axes of a rectangular system of coördinates, the points of intersection of the coördinates for corresponding values of W and l_3 lie in a curve whose trace is a graphical representation of these values in this case. (See Fig. 5.)

By means of this diagram the results which follow are obtained:

The riser is insulated and transmits no heat previous to its entrance into room A; in room A the length of connection is 4 meters, which, according to the diagram, transmits 240 calories to obtain the necessary transmission for room B, 850 calories the heating coils must be 16.25 meters long, and the additional heat to be transmitted in room A,

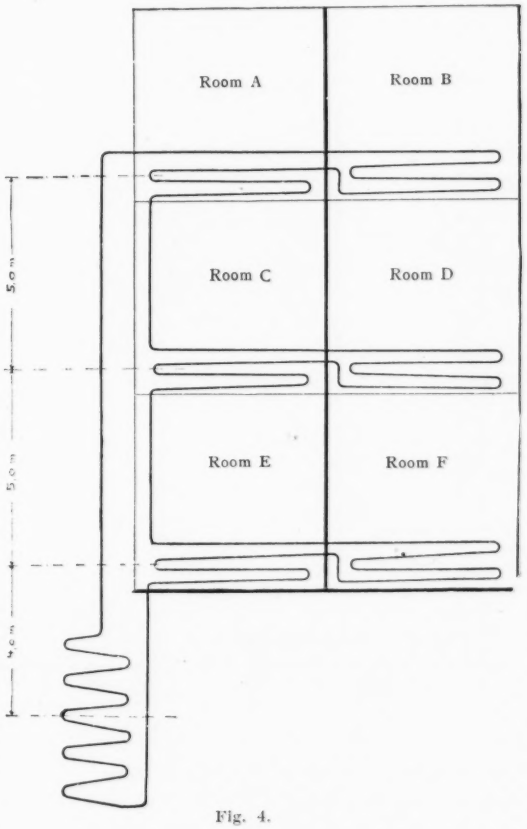


Fig. 4.

700—240=460 calories will require a coil 9.5 meters long. The 8 meters of connections in room C transmit 380 calories, the 650 calories required in room D necessitate a coil 15 meters long, and to make

up the heat transmission necessary for room C, 600—380=220 calories, a coil 5.5 meters long will be required.

The connections in room E measure 8 meters, transmit 300 calories, while the 950 calories to be transmitted in room F require a radiator coil length of 28 meters, and the additional 750—300=

formulas cover every factor that can possibly enter into the calculation. These computations may be applied to existing installations, assist in checking their performances and prove of value in planning improvements that may be found advisable. As a matter of fact, they have been used for both purposes. To mention an instance, the heating sys-

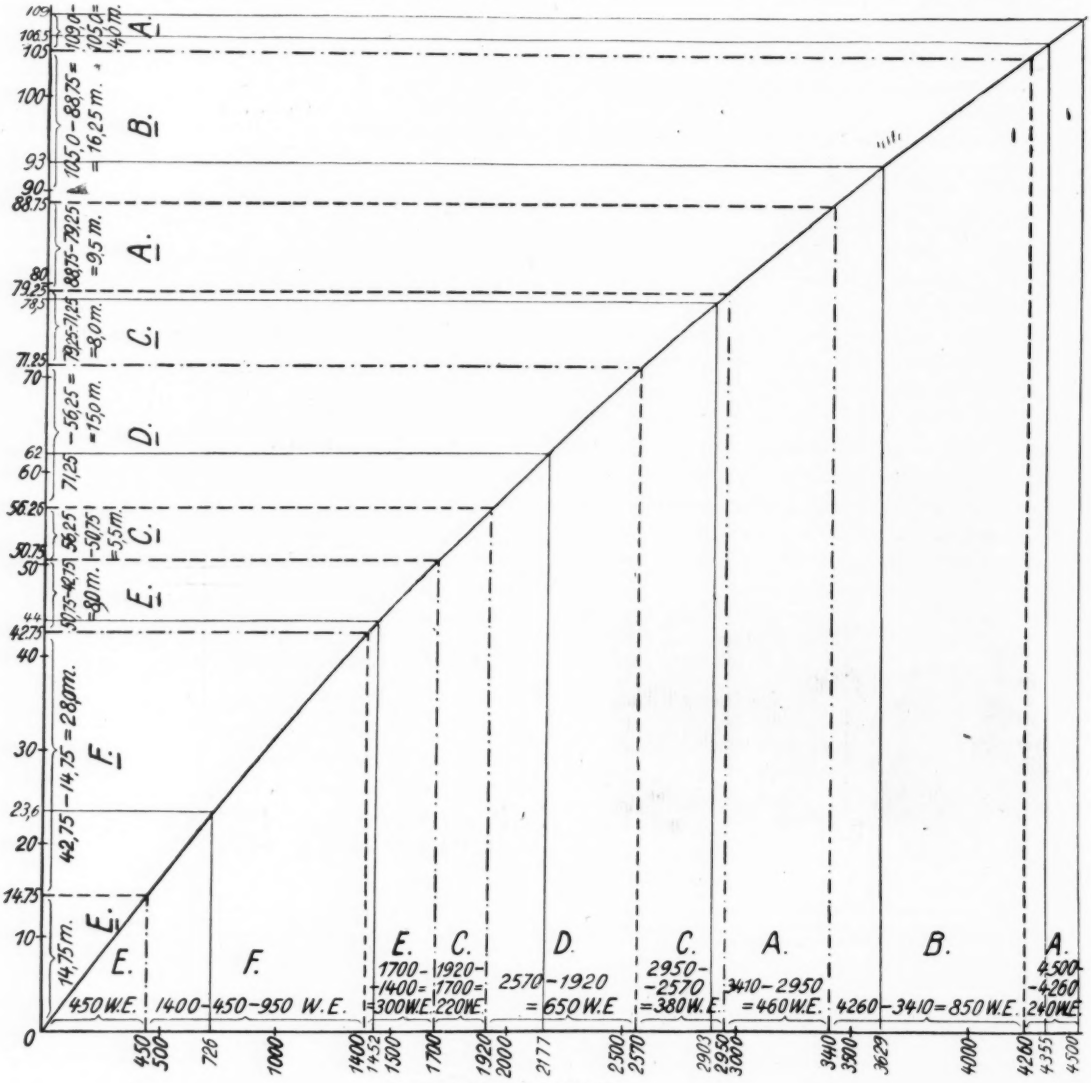


Fig. 5.—W. E.=Calories.

450 calories for room E will necessitate a coil length of 14.75 meters.

After these demonstrations and a little practice the solutions of problems in hot water heating will prove an easy matter. Beside rapidity in execution these processes insure a degree of accuracy which is fully sufficient for all practical purposes, and the

tem of the church at Hainischen was calculated according to this method by the author. This installation was completed in 1899. From the first day of its operation up to the present there has been no derangement, no interference whatever in its functioning, and the proportions and distribution of the radiator coils have been found to be absolutely cor-

rect. For estimating the cost of projected installations the "rule of thumb," unfortunately often used in the carrying out of the actual work, may, of course, be used, but in the construction and installation the calculations must be correctly made to avoid all likelihood of trouble or discussions with builders.

The greater part of the method of application of the fundamental principles above described was elaborated some time ago when the hot water heating system was more in favor than it is at present.

Shop of S. A. Elliott & Son, Santa Clara, Cal., wrecked by earthquake 5:10 a. m. April 18, 1906.

In my opinion, however, the disadvantages attributed to this system are in many instances not justifiable. A carefully calculated and erected system of hot water heating would in many instances prove satisfactory, due to the possibilities of better automatic regulation and greater simplicity in operation, both factors which have been instrumental in gaining for the low pressure steam system the popularity which it now enjoys. The selection of this system can be recommended and under certain conditions presents special advantages; for instance, when the difference in level between the boiler and radiator coils necessary in the low pressure system is not available and would require further excavation of the cellar, in cases where a warm water heating system would prove too expensive and where the recently perfected rapid circulation hot water systems could not be used to advantage for one reason or another, or where these latter appeared too complicated.

It is, however, to be understood that a too high flow temperature is to be avoided. This tendency, it may be mentioned, has greatly diminished as a result of the labors of Prof. Rietschel in demonstrating the advisability of moderate temperatures, but errors in this respect were common in the earlier installations. It must further be pointed out that the radiators are to be placed as far from the walls as practicable and their fittings so arranged as to be easily disconnected to facilitate cleaning when this becomes necessary. The life of a hot water system is greater than that of any other heating apparatus and if installed with full weight pipe and heavy fittings the cost of maintenance will compare favorably with that of any other system.

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OUR READERS' FORUM

CORRECT PIPE SIZES IN HEATING PLANTS.

San Francisco, Cal.—To the Editor of "Domestic Engineering"—Sir: Referring to the query of George H. Claggett in your journal of June 9 concerning "Correct Sizes of Pipes in Heating Plants," I wish to state that I have always used large sizes for steam radiation—that is, larger than most engineers use—but I have taken pains to determine the amount of steam required for the square feet of radiation in the plant plus the square feet of radiating surface in the mains (when cold), allowing a velocity of not more than 25 feet per second in mains, and as low as 10 feet per second in branches to radiators for one-pipe gravity systems. For vacuum systems as high as 50 feet to 75 feet per second is not too high velocity to calculate with most satisfactory results. In both cases the amount of condensation per square foot of radiation will be the same—3/10 pound of steam per square foot of radiation per hour.

The velocities for hot water (gravity circulation) may be based upon a loss of temperature of 10 degrees Fahrenheit and about 5 square feet of radiation to the gallon of water in the radiators, the length of pipes in mains and branches to be considered, in amount of water to be circulated, allowing a heat loss of 180 degrees Fahrenheit per square foot of radiation per hour. This basis is for very small sizes for top floors and medium sizes for middle floors and generous sizes for first floors. Taking all first-floor radiators off the main if basement distribution, and only second floor and higher radiation off risers (this rule applies also to steam distribution same arrangement). A summary of valve sizes for radiator branches, which I have found very satisfactory for one-pipe steam, is as follows: 0. to 24 square feet, 1 inch; 20 square feet to 40 square feet, 1¼ inches; 40 square feet to 75 square feet, 1½ inches; all larger sizes, 2 inches, and all horizontal branches to be one pipe size larger; for two-pipe work reduce one pipe size.

For hot-water radiator branches I would recommend the following valve sizes for a 50 square foot radiator on different floors in the order given, commencing with the first floor: 1¼ inches, 1 inch, ¾ inch, ½ inch.

In the absence of a careful calculation for the size of mains for steam, as given above, Baldwin's rule, "one-tenth the square foot of the radiation in square feet gives the inside diameter of the main and risers in inches," will give very generous sizes, but not extravagant. I also find that this rule plus one-pipe size will work very well for hot-water mains and risers, except where either one should be below the sizes given above for radiator valve sizes, when the latter should govern.

For example, we will take 600 square feet radiation, one-pipe gravity steam, the square foot of 600 is 24.494 × 1/10 = 2½-inch pipe to the nearest standard size. For hot water radiation we add one pipe size, making the main 3 inches inside diameter. This arbitrary rule, however, applies only to plants that have but a moderate length of main, say not over 75 feet, run from heater to first radiator connections. Mains should be carried full size the whole length of flow and return for both systems where it is possible, even if one should sacrifice a little in pipe size of mains. The results will be very satisfactory when this rule is observed. **Thos. Morrin.**

* * *

Montevideo, Minn.—To the Editor of "Domestic Engineering." Sir: In your issue of September 29 Ed K. Munroe has contributed an article that should be of great benefit to the trade. He states that the question of correct sizes for mains and risers in steam plants is of vital importance. My query of June 9, 1906, has brought forward some able discussion, possibly thousands of learners like I have been benefited by it. "Domestic Engineering," in thus disseminating this knowledge, merits the approval of all who are seeking to learn what the correct sizes of pipes should be; possibly others like I did read the "Plumbers' Trade Journal," which teaches the small-pipe doctrine. In its issue for October 1 Charles B. Thompson states that pipes ⅜ inch in size are ample for return pipes on an indirect radiator containing 110 feet, and that this radiator is fed by a 1-inch pipe, and further that the bottom of this radiator is only 8 inches above the water line in the boiler.

Such a radical divergence of opinion as we apprentices find in our study must lead us to conclude that whereas we know nothing there are possibly others that know less. And like the sick horse on the street that was given all remedies prescribed by persons passing that way, we will be as dead as the horse, as far as business is concerned, unless we get these doctors together and they hold a consultation.

When we notice tables giving such different sizes as on page 352 in Mr. Thompson's article, a 2-inch pipe given as correct size for 126 feet, 200 feet, 250 feet, 300 feet, 400 feet, 550 feet, 700 feet and 600 feet using a ¾-inch return pipe, "that more jobs have been spoiled by large piping than by pipe of reasonable size," etc., what shall we conclude?

The writer has ascertained that for a 40-gallon range boiler 1-inch pipes well reamed, using no boiler couplings whatever, is correct and the water gets hot. I even make all turns with long sweep ells to insure a rapid circulation; as I have set boilers both ways and received complaints where the small pipes were used, and a pleasant smile where the big ones get in their work, I am satisfied to continue catering for the smiles.

Mr. Munroe asks me some questions concerning the steam plant which was rebuilt, using larger pipes. The owner has been fireman continuously. There were no traps found. The boiler is an Ideal sectional, of American Radiator Company's make, has damper and automatic

regulator and the boiler and all mains in sub-basement are well covered and no new radiation used. We took one radiator from store, took it to pieces and added it to three or four radiators in the second story. These radiators being so far from boiler (about 140 feet), were fed by 1-inch pipes carried from mains in basement to second story. These 1-inch pipes were taken down and replaced with 1¼-inch and 1½-inch pipes and we added a few coils to each radiator. With 5 pounds pressure at boiler the radiators would hardly get warm, after rebuilding they would get hot quickly with 2 pounds at boiler. We turned the boiler around, placing breeching close to chimney, and we used the same size mains leading from boiler following the same plan, adding about 50 feet more to the 3½-inch main. The 2½-inch main was not changed except the size of the return mains, which were increased

TWO VERY UNUSUAL HEATING INSTALLATIONS.

Some Interesting Queries.

Without further comment the writer submits herewith two heating plans in skeleton. No. 1 is a low-pressure steam-heating apparatus, operating between one and two pounds' pressure. There are sixteen 100-foot radiators attached to each line of 2½-inch pipe, which is supplied by one 3-inch line, connected to the steam dome with two 5-inch pipes. None of the pipe is covered, and as the apparatus is installed in a warehouse the temperature is seldom above 65 degrees in winter weather. At times the temperature of the room will drop as low as 40 degrees. The radiation is not placed in the warehouse for the purpose of heating it to any given temperature.

Another enterprising plumber believes in displays at county fairs. This is a picture of part of a display made by A. P. Elder, of Ottawa, Kan., at the Franklin county fair last September. Hot and cold water was connected to all fixtures and a special natural gas main was laid over 500 feet to supply gas for fuel and light.

some, and a bleed pipe was changed from 1-inch to 1½-inch. There were no ⅜-inch return pipes, but we concluded that 1-inch pipe was rather small and pulled about 200 feet of it out of the plant. The increase in pipe sizes must have effected the saving in fuel. That is our opinion. Those 1-inch pipes, owing to condensation in intense cold weather, failed to get the steam to the radiators. The water would get out of the boiler and all through the system, frightening the owner's family. They would let more water into boiler, and soon discover the boiler was too full and have to draw some out. Since the rebuilding was done, the water stands in the glass about the correct height, there is no noise through the system as before, the fuel bill is reduced about one-half and the owner contends that a larger boiler, and still larger pipes, would make the plant more economical. He may conclude to change to a steel tubular boiler of larger size; in case he does we will note results and send them to "Domestic Engineering." **G. H. Claggett.**

We would be pleased to have those of your readers who have decided opinions on the subject, point out the operation of this apparatus under the following conditions: When the surrounding air is 65 degrees, the condensation in radiation and piping 0.28 pounds per square foot per hour, and the initial gauge pressure 2 pounds, what is the terminal pressure? At what point will the water stand in the return line? What space will the condensation occupy in the ¾-inch return pipe? In what time will the steam make the circuit of pipe if turned into the mains when the temperature of the piping and the air is 65 degrees?

In figure 2 we show a rather unusual installation of indirect heating. The indirect radiators are shown without boxing, so the piping can plainly be seen. The extreme distance from the boiler is 20 feet—that is, the 1¼-inch main, which carries 250 square feet of indirect and 80 square feet of direct radiation (a total of 330 square feet) is 20 feet in length. The main, with three indirect radi-

ators attached to it, contain 214 square feet and is 15 feet in length. A coil in the fire pot heats a 60-gallon range boiler.

The boiler has a 24-inch round grate and is rated in the manufacturers' catalogue, according to standard rating, to carry 650 square feet of condensing surface—that is, radiation and piping. Adding the usual 50 per cent to the indirect radiation, there is a load on this boiler of approximately 800 square feet.

to 10 pounds, what happens? Will it be possible to operate this apparatus at any pressure desired, without noise? Is there a possibility of these small pipes filling up, and if so, how long before they must be replaced? What will the pipes fill with, scale or sediment?

Considering the size of the boiler and the load attached to it, how frequently must the boiler be stoked to maintain in the house a temperature of 70 degrees when the external temperature is zero to 10 degrees above, and how

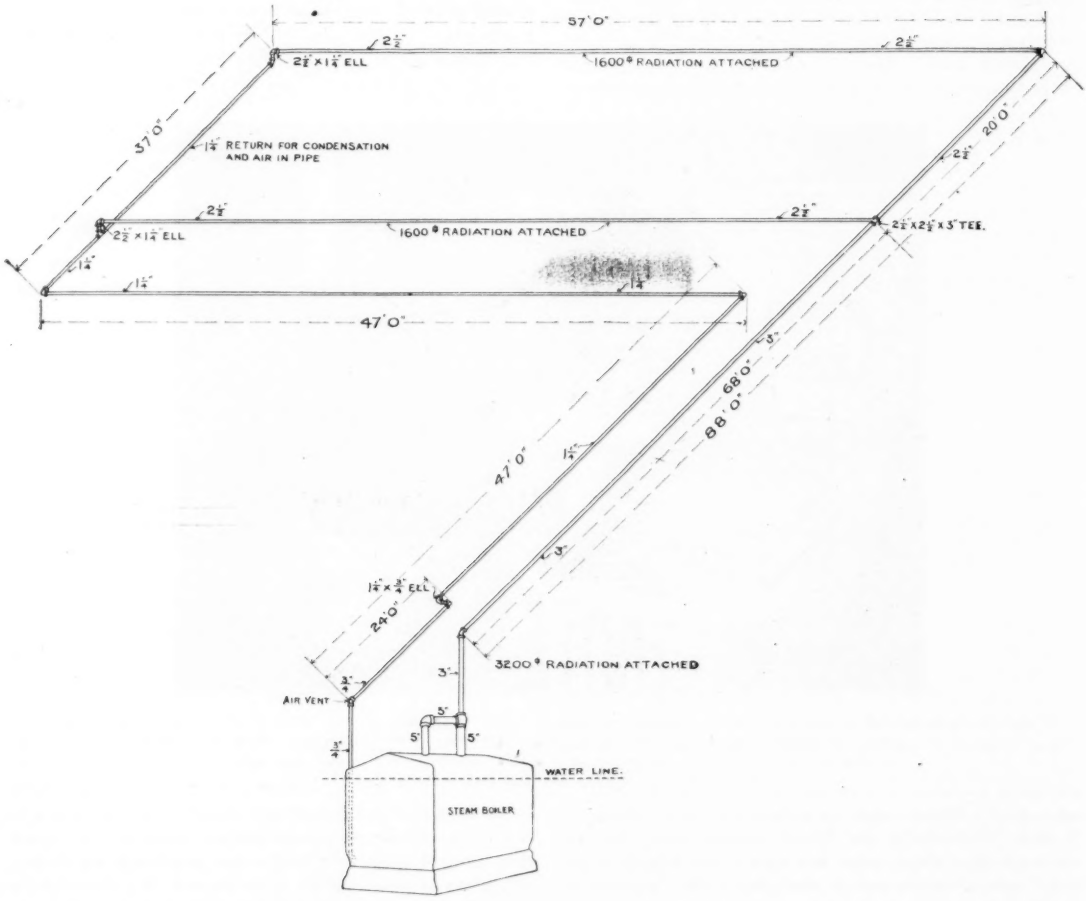


Fig. 1. One pipe steam heating circuit.

We extend an invitation to your readers to look this plan over and give their opinion as to how such an apparatus will operate. What pressure will be required to keep the radiation filled with steam in zero weather? Assuming two pounds, what will be the pressure drop between points marked A and B? And at what point will the water stand in the return line? How long will it take to fill the radiators with steam at a given pressure? With the demand at maximum, is it possible to keep the radiation filled with steam when initial gauge pressure is maintained at 4 ounces? If the gauge pressure is run up

often when the external temperature is 40 degrees?

The indirect stacks are open at the bottom and receive the air from the basement at a temperature of 50 degrees in zero weather and 60 degrees when external temperature is 40 degrees. The air is tempered and circulated by the adjustment of two windows at opposite ends of the basement. The dust nuisance is eliminated by a sprinkler in the ash pit, connected to the city water pressure. Point out objections to this method of indirect heating.

The apparatus is installed in an ordinary nine-room house. There is nothing unusual about it except its pro-

portions. No air valves are used on any of the radiators. The surface is intended to warm the room to 75 degrees if required when the external temperature is zero.

W. E.

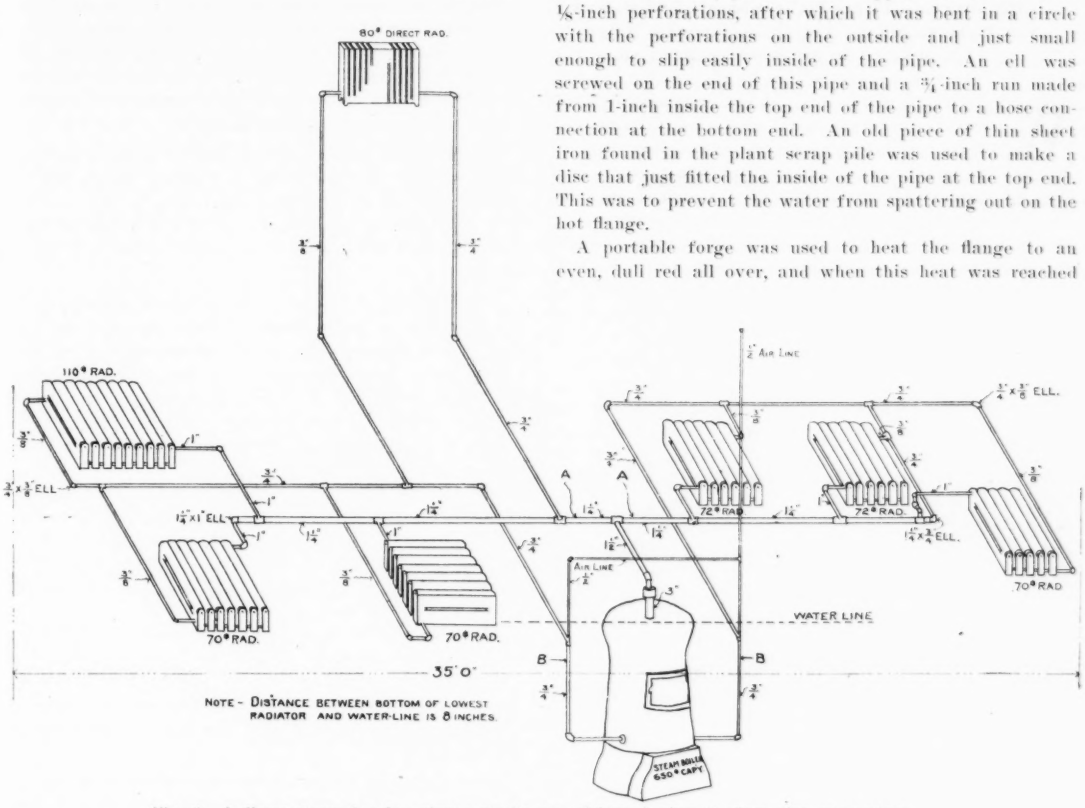


Fig. 2. Indirect steam heating plant; stacks are without boxing to show pipe connections.

AN EMERGENCY FLANGE REPAIR.

We were refitting an old plant with a new steam line from boilers to engines and the work was progressing nicely, when Jack found a flange that was cracked and had to break it off. This was rather unfortunate, as we were trying to get the main header in position to cut in, so the plant could start up on time the next morning. As it was on Sunday everything in town was closed up, and as there were no machine tools at the plant large enough to serve, should we need them, we seemed to be in the middle of a pretty bad fix, writes L. L. Arnold in "The Practical Engineer."

In searching over our list we found we had one 16-inch flange to spare, but when we tried it on the pipe it was found to be too small and would not screw on more than two threads. It was getting along in the afternoon and time was becoming more and more limited, when at last we decided to put it on hot. We were afraid it would crack, but it was the only chance. We had been working on the flange for some time and had coaxed it to screw on three threads fairly easy, so locating the bolt-holes in their proper position, we marked the flange and pipe so we could have a guide when needed for placing the flange on the pipe.

The piece of pipe was located in an inclined position, with the thread end at a convenient height for working, and held from turning by two pairs of chain tongs. A piece of ¾-inch pipe was then capped and drilled with ⅛-inch perforations, after which it was bent in a circle with the perforations on the outside and just small enough to slip easily inside of the pipe. An ell was screwed on the end of this pipe and a ¾-inch run made from 1-inch inside the top end of the pipe to a hose connection at the bottom end. An old piece of thin sheet iron found in the plant scrap pile was used to make a disc that just fitted the inside of the pipe at the top end. This was to prevent the water from spattering out on the hot flange.

A portable forge was used to heat the flange to an even, dull red all over, and when this heat was reached the water was turned on at the hose connection to keep the pipe cool. The flange was handled with iron rods through the bolt holes and was screwed back to its proper position without trouble. Care was taken in cooling not to hurry matters too much, and the job turned out all right.

It is now admitted by most authorities that alcohol is no food at all; that it is wholly unnecessary, if not injurious to healthy persons, and that it is only useful in some forms of medical treatment.

The Chinese in the mines of South Africa exert themselves as little as possible when on salary, but show great activity when on piecework. A similar discovery is said to have been made outside of the Chinese race, and some have gone even as far as to claim that this is really a characteristic of western civilization.

The general prosperity of New Zealand is remarkable. Out of a population of a little less than 1,000,000, one-third have money in the savings banks. The wealth a head is nearly $1,500, which is the largest of any country in the world. Statistics show for New Zealand the highest health and the lowest death rate of any country.

Advice To Beginners in Hot Air Heating

By T. J. Grier, of Pittsburg

Hot Air Furnaces Are Here to Stay—Sales Will Constantly Increase—How a Furnace Should Be Set, How the Pipes Should Be Run, With Practical Helps on First Steps to Be Taken by the Novitiate.

WE are in a position to say there has been a steady growth and demand for warm air furnaces, and they are rapidly increasing and growing in popularity. It is truly justice to the furnace trade in saying the demand is general, inquiries coming from all parts of the United States and Canada, and a large demand from the southern states. The last named territory is a new field opened to this class of trade in the last few years, and with proper handling both by the dealers and manufacturers it will develop into a most excellent furnace territory.

It is quite easy to answer the question: Is the warm air furnace here to stay? There is nothing to take its place, and it has become a necessity, being adapted to the heating and ventilating of buildings of every description.

Their use for all sizes of buildings is, in particular, all conditions being equal, the preferable one, in the opinion of the writer. They are comparatively cheap as to first cost and are readily adapted to most all conditions and requirements. They are in general very satisfactory as compared with other heating systems, such as steam or hot water. This being a most potent factor in some cases, we may say, is a main inducement to many purchasers and users of heating apparatus. They perhaps otherwise would never have put in a heating apparatus at all, but would have contented themselves with the present day stoves.

Furnaces of all kinds are being handled and sold by the majority of general hardware dealers and tinners throughout the country. The facilities for doing this kind of work in the way of tools and material are always at hand, and mechanics are readily available to put up the furnace and pipe connections. However, it is quite frequent that the ordinary sheet-iron worker is not capable of engineering a large heating system, but if he had help, in the way of the system laid out properly, it would be an easy matter.

Advice for Beginners.

The writer has never found any clear and fixed rules on this subject which would prove of much practical value to the ordinary, every-day furnace man and which would stand a rigid test of proof. It is next to impossible to secure such rules and data as will truly guide the inexperienced furnace man to success in all the different classes of buildings.

In consideration of these facts we advise, where the dealer intends taking up this class of work, if he is not practical along the lines it would be by far the best policy to secure a sheet-iron worker who is well posted along the lines of furnace work and give him charge of this department, both in figuring the cost of such work as may come before him and in superintending the installing, and it should never be intrusted to a clerk unless he is positively competent to know when a job is properly set and that it will work satisfactory. It is of course understood that the dealer and his furnace man should together go over all propositions made on heating work, and the dealer should certainly keep himself posted as to prices for such material as his trade demands.

We would advise, when the dealer has secured such a man as can take hold of his furnace work, that he should take up a line of furnaces manufactured by practical men who will be willing to engineer and make plans for all such work as the dealer is not capable of handling.

General Rules.

Our time will prevent giving general rules in the most practical way for installing a heating plant, but the dealer who has no extensive experience in this line will find the following instructions useful and in almost every instance successful, except in school house and church work.

The location of a furnace is governed principally by the situation or the exposure of the house and the location of the chimney. In all the rooms upon those sides of the house which are exposed to the prevailing winds, the temperature will be found to be lower and the air pressure higher than other parts of the house. The increase of air pressure in these rooms makes it necessary that the warm air flues leading to them should have the highest practicable temperature and pressure, in order to flow into the rooms in sufficient quantity. These flues must, therefore, be connected to the furnace with the least possible length of horizontal piping and, consequently, the proper place for the furnace is near the exposed, or coldest sides of the house.

The work should be so planned that all long horizontal pipes will be connected only to the tallest vertical flues, and that only short ones will be employed to serve registers on the first floor. The furnace should be located as centrally as possible, with all due consideration for exposure.

Great care should be taken to avoid setting up the furnace over a drain pipe of any kind. Even a well made iron pipe drain is so liable to be broken or made leaky by the weight of the furnace that it must not be permitted to run under it.

The furnace should be set at the lowest practical level, so that the longest horizontal warm air pipe may be given a sufficient upward inclination to make it operate well. In some cases the ceiling of the basement is so low that it is necessary to set the furnace in a pit. The extreme of the furnace casing should never be less than eighteen inches below the ceiling or floor joist, and should be as much more below as possible.

The pit, if one be required, should be made large enough to afford plenty of standing room for the person who attends to the fire, and to permit the free use of the poker and the shovel when removing ashes. The bottom should be covered with one course of brick, or with concrete at least two inches deep, or better still with flagstone.

The Air.

The furnace should be supplied with fresh air by means of a duct which has an inlet at some point above ground upon the windy side of the house. This inlet or cold air box, as it is often called, must always be on that side of the house where the air pressure is highest; if it opens to the leeward side the warm air in the furnace is very

liable to be driven down through the cold air flue and discharged out of doors.

Cold air inlet openings should always be made high enough above the ground to prevent surface water from entering them, and they should be covered with wire netting to keep out animals, etc. They should always be made air-tight, so that no air can enter the furnace from the cellar.

Inside cold air ducts are often used, taking cold air supply through a register in the floor; the air then circulates through the furnace and through the rooms continuously, without the introduction of any air from the outside. This method is very successful and economical, and when this arrangement is used in private residences the inside supply register should be located in the hall and if possible near the front door.

Double register boxes should never be used if they can be avoided. During a great part of the time the air pressure in one of the rooms is likely to be higher than in the other, and the difference will be sufficient in many cases to drive most of the warm air into the other room. Separate flues should always be run to each register.

Heating by warm air furnaces cannot be performed successfully on a large scale without taking into full consideration all the circumstances which affect the distribution and diffusion of warm air. The introduction of currents of highly heated air into a room may be either a great aid to ventilation or a serious impediment, according to the manner in which it is managed. It should never be undertaken only by an experienced engineer.

All furnace manufacturers are quite willing to give their dealers such help as is necessary in the beginning, and if necessary will send an experienced man to help sell, or erect a few jobs in the beginning of his furnace business.

A dealer should have at least 30 per cent profit on all his furnace work, and in some instances that is not enough, as it will be necessary to make several trips to a job that does not work properly and it is quite probable that some change will have to be made after the work is completed to make it work.

The writer has had sixteen years' experience in heating with furnaces and in this time has only come in contact with two persons who had the least inclination in buying furnaces from the catalog houses, and it is safe to say the catalog house has but little business with the dealers in the way of selling them furnaces, and but a small percentage of people who buy furnaces go to the catalog house for this class of goods.—The National Hardware Bulletin.

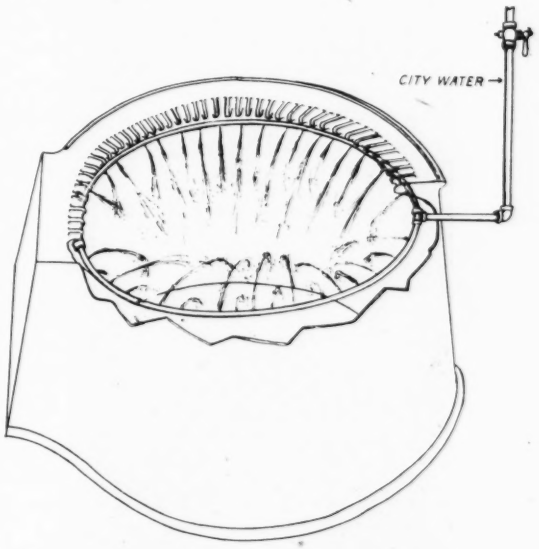
Do Office Buildings Have too Much Plumbing?

The Law Building, of Indianapolis, presents a feature that is not met with every day, but Harry G. Coughlen, who is in active charge, volunteers the assurance to "Building Management" that it is not unique even in his own city. The Law is one of the best buildings in the city in point of location as well as service and appearance, yet it has no lavatories in its offices. Public lavatories and toilet rooms are provided on each floor for the men and a single lavatory on an upper floor for ladies, but none of the offices possess its individual conveniences. Even more interesting is the fact that it does not seem to affect the rent roll of the building in the least. All of its space is nearly always rented and at prices which are in keeping with the location.

The building was intended for the occupancy of lawyers, and the public lavatory feature was a part of the general design. Rooms are set apart for a law library and lawyers constitute practically the entire tenancy.

To Prevent Dust of Ashes in Heater Room

An ingenious device has been placed in operation by C. B. Thompson, connected with the American Radiator Company, in connection with his own heating plant in Buffalo, N. Y. It is fully shown in the accompanying drawing. It consists of a perforated ring of pipe at the top of the ash pit of a steam or hot water heater and at-



tached to the city water supply. The holes in the pipe being deflected downward in order that no force of cold water shall be thrown against the hot grate just above it. Water is turned into this ring during the operation of the shaking of the furnace and the ashes are thus prevented from disseminating dust throughout the heater room.

Pure copper cannot be cast in sand without considerable difficulty; in fact, some deoxidiser is always used, says Metal Industry. For common copper castings from 2 to 5 per cent zinc is generally added to get sound castings; but for electrical work this is useless. The only way to get good electrical castings is to melt pure electrolytic copper in a plumbago crucible under a thick layer of charcoal. When thoroughly melted add 2 per cent silicon copper and stir it in with a stick and cast as soon as ready. Practical experience alone will show the correct temperature for casting copper in sand molds, and the proper temper of the sand. It must not be cast boiling, but a fairly high temperature is necessary.

The Plumber

A valued subscriber has sent us this editorial from a Terre Haute (Ind.) paper, whose name we do not know; but the article is so interesting and appreciative of the plumbers' art that it would probably be worth while for master plumbers to cut the article out and send it to their local paper requesting the editor to publish it.—ED.

For the difference between the conditions of living fifty years ago and now, in Terre Haute, for instance, we do not think of any one man who has had more to do with it than the plumber.

About fifty years ago, as many can remember, there was not an iron gas pipe, a lead water pipe, a steam heat-

Two leading master plumbers from Mexico City—Javier de la Torre and Joe A. I. Claudon.

ing pipe or a sewer pipe in the city and not a plumber to make a joke about.

Now there are about a dozen plumbing establishments, besides the other lines of business which might be classed under the general head of plumbing, and the work done for the gas and water companies.

At first thought it might seem strange that any American town of 10,000 people, of fifty years ago, was behind the Roman cities of 2,000 years ago in the matter of plumbing, but they were.

A Terre Haute traveler, when asked what was the most remarkable or interesting thing he had noticed in the city of Pompeii, which had been dug out of the ashes that fell nearly twenty centuries ago, replied, "the plumbing," for there in the old cities are to be seen the ruins of aqueducts and fountains, and in the old houses are pear-shaped lead pipes made from sheet lead to convey water.

The wild races which swept the Romans out of power and destroyed their cities also put the ancient plumbers out of business and plumbing was for hundreds of years one of the lost arts.

There is a lot of history and many chapters of science back of the beautiful exhibits made in the plumbers' shops and windows of this town, and a progress that has been most rapid in the last few years, as sanitary science has been incorporated with plumbing and art put into the fixtures and workmanship.

The kitchen and bath room of the modern house, in which the plumber has been given carte blanche, are as beautiful and ornate in their way as the parlor and library. They breathe of freshness, cleanliness and health.

Instead of decaying woodwork, rusting pipes and dingy colors are the open pipes, white or shining brass, snowy porcelain, polished silver or nickeled finishings, inodorous drain pipes and various other mechanical tricks as ingenious as simple and effective.

The deadly sewer gas and the fatal gas leaks once so common have been eliminated, and steam courses through house pipes without a sign of leak.

The manufacturer has adopted the recommendations of sanitary science and the designs of the art schools, the plumber takes out a license as a guarantee of his skill, and the other pipe fitters, in gas and steam and water, have to be first-class mechanics for the work, which must be absolutely secure and safe.

In a town which once had not an inch of pipe there are now few houses in which the plumber has not done work, if we include under the one head the different kinds of work necessary for gas, water, steam and sewage.

In short, in the march toward better sanitation, more comfort and greater elegance of living, the plumber has marched near the front in the procession.

A NEW PROCESS FOR MAKING MALLEABLE IRON AND STEEL.

A new process for directly converting iron ore into malleable iron or steel by a continuous system has recently been made by two Australians, Messrs. Heskett and Moore. It is claimed that the new discovery will effect a saving of 25 per cent in the manufacture, says Scientific American. The ore is simply concentrated by ordinary methods, or if it is magnetic it is separated electrically until the pure oxide of iron is obtained. The oxide of iron is passed through a revolving cylinder heated by waste gases from subsequent operations, and brought in that cylinder to a dull red heat. It drops from the cylinder to a second similar cylinder, and in the latter it is brought into contact with the deoxidizing gas, which is forced through and brought into contact with the heated ore. The heated ore is thus converted into a pure iron. Accompanied by and protected by the deoxidizing gas, it is passed into a third chamber or melting hearth, where it falls into a bath of molten iron, and is converted directly into steel or balled up as malleable iron.

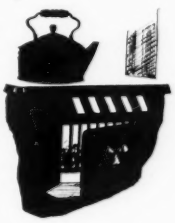
Use Less Water

Most Hot Water Heating Systems Contain from 25 to 30 per cent too much Water

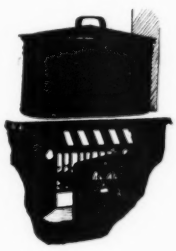
It's the most common cause of failure

The heat necessary to raise one pound of water one degree is one British Thermal Unit. To raise one pound of water from 40° to 180° requires 140 British Thermal Units.

In a hot water heating job the problem is to transpose the heat from the burning coal to the water and then to the air to be heated, with as little loss as possible. It's a surprising fact that after years of study some one has not before discovered that it is nearly always done with almost the greatest possible waste.

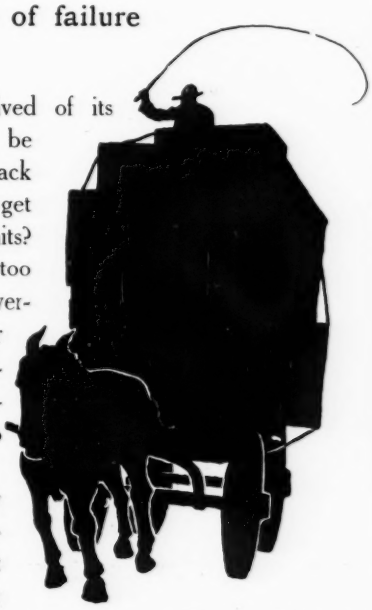


Here's a homely example. On your coal-stove put a tea-kettle and a wash-boiler, each filled with water. With half a pound of coal you can boil the tea-kettle, but you cannot materially change the temperature of the wash-boiler.



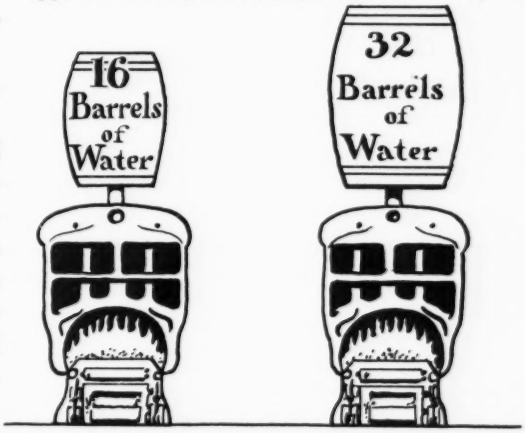
Why? Too much water.

Here's the application: Take a hot water heater and connect it to a system containing 16 barrels of water. Connect a heater of the same size to a system containing 32 barrels of water. Put 25 pounds of coal in each fire box and kindle your fires at the same time. Which system will be warmed first? Which radiators will be giving off heat first? In which system will the water, deprived of its heat units, be first racing back to the boiler to get more heat units?

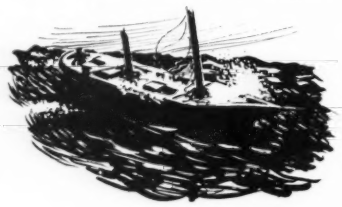


You are too sensible to overload your truck expecting a diminutive pony to move it.

Then why do you overload your hot water heating plants? Why do you expect them to do stunts opposed to every known physical law? Why do



you expect a plant with 32 barrels of water to absorb heat from the fire, carry it to rooms, and return to the heater as quickly as one with 16 barrels?



You are too sensible to expect a waterlogged derelict to make the same speed as a trim, correctly designed racing yacht.

Then why do you expect your water-logged heating plants to accomplish work which they could easily do if they were better proportioned?

Heater manufacturers are making new models of hot water heaters with 25 per cent less water capacity than formerly, and we predict that in a few years water radiation will generally be designed with a greatly decreased water capacity.

In nearly every hot water heating job you have put in which has not worked satisfactorily, we believe the trouble can be cured by eliminating 30 per cent of the water in the system.

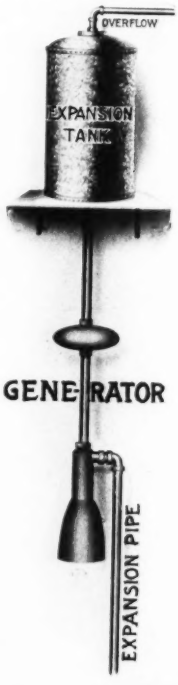
In nearly every job of hot water heating which consumes an undue amount of fuel, we believe the trouble can be cured by eliminating 30 per cent of the water in the system.

In every new job you are figuring on you will secure a better working system, make a 25 per cent saving in labor of installation, and 10 per cent saving on radiation, piping and fittings, by planning to eliminate 30 per cent of the water.

But we have discovered it must only be done when you also increase the rapidity of the circulation.

It is this condition that does the work:

1. A smaller quantity of water.
2. A safe, slight pressure, and
3. Rapid circulation.



OUR PROPOSITION.

The Honeywell System does these things for you.

If you will send us a set of plans for the next hot water job you figure, or have the contract for, showing the boiler and radiators located and their capacities indicated as you have been accustomed to figuring for your latitude, we will make you a complete piping plan, without charge, for the "Honeywell System" (the system of rapid circulation).

Our plan will be complete, and will show all the pipe sizes and radiator tappings, and will show you that it is 10 per cent cheaper to install.

Or, if you have old, unsatisfactory work, which has defects you are unable to remedy, send us the plans, with the same data. We will tell you how the trouble can be remedied, and will send you a drawing showing you how to apply a Honeywell generator so as to cure the defect. But we only do this under this guarantee:

If, when you apply the Honeywell Heat Generator of the size and in the manner specified by us, the defect is not cured, you will return the Generator, allow us to pay freight both ways and send you Three Dollars to pay you for the labor of connecting and disconnecting it.

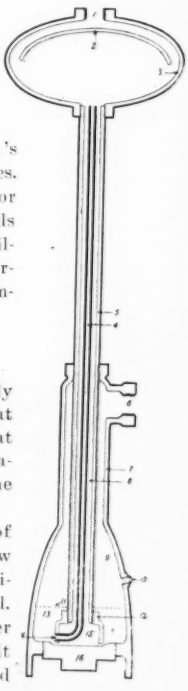
You can save an old, defective job and enhance your reputation as a fitter if you do as we suggest at once.

For new work we guarantee the Heat Generator will do these things:

1. Increase your profits 10 per cent on all hot water heating work.
2. Save 25 per cent on cost of labor of installation.
3. Put you ten years ahead of your competitors in hot water heating.

WHAT IT IS.

There's nothing mysterious in the Honeywell system. Our heat generator is simply a device designed to be connected to the expansion pipe of a hot water heating system, for the purpose of controlling the expansion of the water in the system.



You know that hot water, under pressure, circulates faster under increasing temperature, than in an open system. But it's a dangerous trick to do with valves.

The Honeywell Heat Generator generates a pressure of 10 pounds on the water, without any possibility of sticking and causing dangerous pressure, or leaking and becoming useless.

HOW IT OPERATES.

It operates by mercury similarly to a gas-proving gauge, only that the Generator is so constructed that there is a positive internal circulation of the mercury so long as the water is being heated.

Its use diminishes the quantity of water in the system, and in new work permits 10 per cent less radiation and smaller piping to be used.

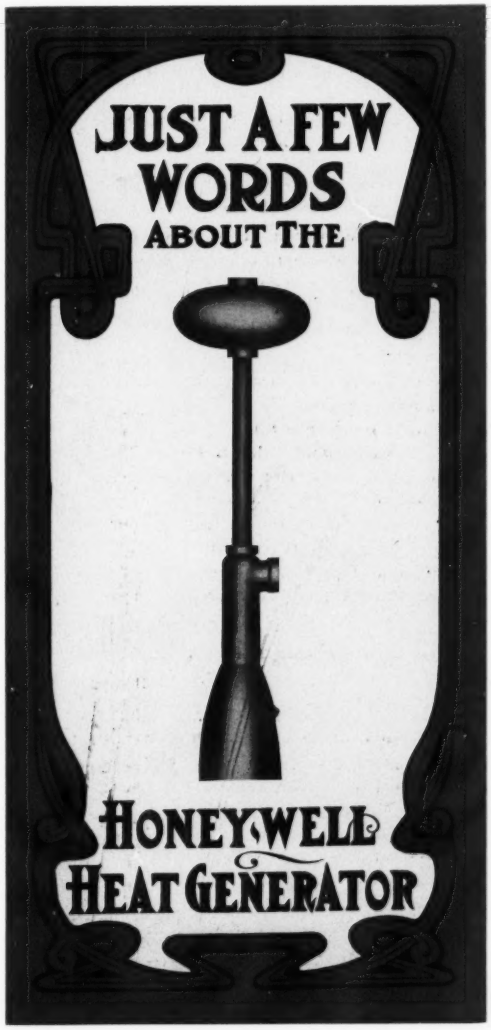
The smaller the quantity of water contained in a plant, the quicker it can be heated. By the increased

circulation caused by the Generator and our method of piping, the water is delivered more quickly to the radiators, which parts with its heat and returns to the boiler.

We do all this without increasing the temperature of the water. With the Honeywell system only normal temperatures are required.

Know Us Better

We want you to know more about the most interesting discovery yet made in hot water heating. We want you to tell us your hot water heating troubles. Our engineering staff is at your free disposal and will gladly make suggestions as to how they may be avoided, We want you to have this booklet describing the Honeywell system, and will send it to you free.



THIS FREE

FOR THIS

THE HONEYWELL HEATING SPECIALTY COMPANY WABASH IND.

CUT ALONG THIS LINE

Honeywell Heating Specialty Co. Wabash, Ind.

AT NO COST to me, please send me JUST A FEW WORDS About the Honeywell Heat Generator.

Name _____

Street _____

Town _____

State _____

But does the "Honeywell System" Work?

The largest manufacturers of hot water boilers are recommending and selling it. The most representative fitters in the country are using it and reordering it. These are testimonials from some of them:

THE ENTERPRISE STEAM AND HOT WATER HEATING CO.,
Baltimore, Maryland.

We have installed in the neighborhood of seventy jobs on the HONEYWELL SYSTEM with excellent results.

As far as we can see, it does all that is claimed for it.

It is a decided improvement on modern hot water heating.

ANDERSON-DARRAGH CO.,
Pittsburg, Pa.

The HONEYWELL SYSTEM is undoubtedly the coming system of hot water heating. We predict that in five years, it will be universally used.

We have installed twelve or fifteen jobs on this system and it is far superior to the common method.

M. H. CRANE ESTATE,
Cincinnati, Ohio.

We are convinced that your theory is right in eliminating all the water possible from the system. Then, by placing a check or a safe mercury pressure on the water, which stimulates its action during increasing temperatures, the very best results are secured.

We believe that the HONEYWELL SYSTEM is right. We are giving it a thorough trial.

KIRKHOFF BROS.,
Indianapolis, Ind.

We placed one of your HEAT GENERATORS on an old job that formerly required three or four hours' time every winter morning to heat the house to a comfortable temperature.

Since attaching the GENERATOR, we find that the building can be heated in one-half the time that was required without the GENERATOR.

We have used more than a dozen of these GENERATORS and thoroughly believe in them.

CARSON-PAYSON CO.,
Danville, Ill.

We have installed the HONEYWELL SYSTEM on three different jobs and are, ourselves, very much pleased with the action of these three systems and think there is no doubt but that it is an excellent thing, and our experience would lead us to say that it would not be necessary to fire the apparatus anywhere near as hard with this system as would be necessary with a common job.

We are recommending the HONEYWELL SYSTEM on all hot water jobs which we are now installing, which, perhaps, is the best measure of our estimation of its value.

JOHN A. NORTH,
Xenia, Ohio.

We have just tested the HONEYWELL SYSTEM, the HEAT GENERATOR for which we bought of your Mr. Tillman two weeks ago. It did more than he promised and we are more than satisfied with it. It is a wonderful thing.

I am so convinced by this one test of it being all right, that I am going to use it on all of my work hereafter.

MT. VERNON PLUMBING & HEATING CO.,
Mt. Vernon, Ill.

We have completed the job we were changing from centralized work to gravity.

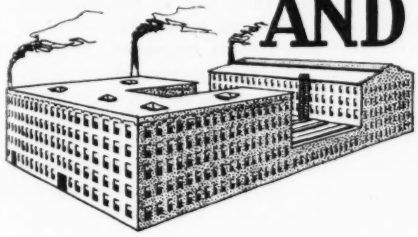
This plant was constructed with one inch pipe throughout. We made no change in the piping except to attach our mains in the basement. Our opponents gave us the laugh, saying such was an impossibility, but inside of thirty minutes after the fire was started, every radiator on the job was good and hot.

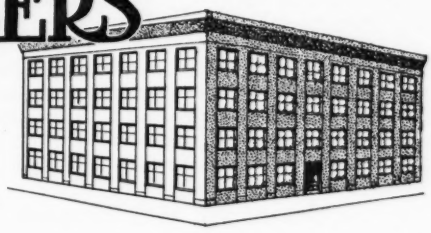
On the end of one of the mains we have a radiator containing one hundred and sixteen feet on the first floor supplied with one inch valves. This radiator heats equally as well as the others.

AURYANSEN & SCHEINLER,
Piermont, N. Y.

We have used one of your GENERATORS on the job we wrote you about and it works to a charm.

FROM THE MANUFACTURERS AND JOBBERS





Wholesale Plumbing

The Central Brass Manufacturing Company, of Cleveland, O., send us a very valuable mule barometer, which is not only amusing but instructive.

The order for water closets for the Fairmount Hotel in San Francisco, numbering 600, has been secured by the John Douglas Company, of Cincinnati.

Lots of plumbing and heating goods will be needed in San Francisco for a long time to come, and next year bids fair to be bigger than this, writes our correspondent from that city.

The United Brass Manufacturing Company, of Cleveland, has completed a new plant four times as large as its former one. They say they believe it is one of the best laid out and equipped brass factories in the country.

The Hydro Press Company, of Rochester, N. Y., has been incorporated, with a capital of $75,000, to manufacture plumbers' specialties. The incorporators are: Peter Gommel, F. A. Wegner and Adolph Nolte, all of Rochester, N. Y.

The Chicago Brass Company, of Kenosha, Wis., has just completed two new factory buildings at its plant and it is having plans prepared for other additions. It is planned to spend about $1,000,000 for improvements and additions to the plant.

The filter business of Thos. W. Goreau, 1050-52 St. Charles avenue, New Orleans, La., has been taken over by a company which will be known as the Crescent Filter & Specialty Company. The plant will be located at 1052-56 Annunciation street and 611-623 Calliope street.

A report has been current in the trade that the Hercules Iron & Supply Company, of Boston, with a foundry and manufactory at Anniston, Ala., intended to establish an enamelling plant at the last named place. We are authorized to state that there is no truth in the report. The subject has been considered, but the difficulty in securing labor has caused the project to be abandoned.

Readers of "Domestic Engineering" seeking improved positions or desiring responsible employes, should make a practice of studying our classified advertising column. There are a number of good things there this week, and good things crop up every week, and between now and January 1 any person who is desirous of improving his position or any employer who is desirous of securing better help, will find exactly what he needs in this column. The cost for advertising in this line is 10 cents per line per insertion. In case the position you are seeking is not advertised, you will be able to obtain it by putting in an advertisement of your own.

Wholesale Heating

The Homestead Heater Company, of Homestead, Pa., has been sold to a party of local capitalists headed by John D. Stahl, president of the Homestead National Bank. The capital stock of the concern, which is $50,000, will be increased to $100,000.

Fire totally destroyed the large factory buildings adjoining the plant of the National Air Cell Covering Company, 70-78 third street, Brooklyn, N. Y., but it has only temporarily incapacitated its own plant, and within two or three days it expects to be able to resume operations.

Standard Humidifier Company, of New York, has been incorporated with a capital of $25,000 to manufacture ventilating devices. The incorporators are Charles A. Brodek, 230 West Ninety-ninth street, New York; Ralph H. Raphael, 45 Edwin Park road, Montclair, N. J., and Winfield Bouynge, 931 Washington street, Hoboken, N. J.

The S. Wilks Manufacturing Company, Thirty-fifth street and Shields avenue, Chicago, has just finished the erection of an addition to its plant, 50x150 feet, two stories high. E. W. Sedgwick, president of the company, advises us that the present year will be the most prosperous they have had since they have been in business.

Smith & Anthony Company, of Boston, advise us that the great and continued advance in the cost of materials and manufacturing compels them to make a slight advance in the prices on all of their goods. They therefore withdraw all former prices and quotations and are preparing a new price list, showing an average advance of 5 per cent.

We are advised that the connection formed April 1, 1905, between the Howe Manufacturing Company, of Louisville, Ky., and Blake & Andros, 195 High street, Boston, has been dissolved by mutual consent. W. E. Blake, 141 Federal street, Boston, Mass., retains the patterns of the "Thayer" and "Crescent" steam and hot-water heaters and will continue their manufacture.

The Norristown Magnesia & Asbestos Company has purchased the business of the Norristown Covering Company, of Norristown, Pa., and will continue it under the same careful management with increased capital. The company has purchased additional real estate and machinery

and will extend the business in all its various lines. With its new facilities the company expects to make all deliveries promptly.

The thirteenth annual meeting of the American Society of Heating and Ventilating Engineers will be held in New York City on January 22-24, 1907, in the new Engineering building, if ready at that time, but if not completed the meeting will be held in the society's old quarters, at 12 West Thirty-first street, according to announcement just received from Secretary W. M. Mackay. Papers and topics for discussion to be presented at this meeting should be in the hands of the secretary early in December.

Steam and Mill Supplies

The All-Metal Valve Company, of New Brunswick, N. J., has been incorporated with a capital of $50,000 to manufacture steam specialties. The incorporators are F. R. Jones, of New Brunswick; E. H. Hobby and T. R. Patren, of Camden, N. J.

Harris Tabor, who for some years has been less active than formerly in the Tabor Manufacturing Company, is about to locate permanently in Philadelphia and will take a very active interest as consulting engineer to the business. Mr. Tabor's reputation and standing as a pioneer in developing the art of machine molding will impress the trade generally with the importance of this announcement.

THE INCREASED COST OF SELLING MACHINERY.*

By Henry Prentiss, of New York.

What constitutes the selling cost? The principal items are interest on capital invested, taxes and insurance, rental, salaries, traveling expense, handling expense, including cartage, loss and damage, advertising expense, including catalogues, circulars, etc., telephone and telegraph charges, stationery and postage, office equipment and bad debts. It is our common experience that these various items of expense have grown materially during the past few years; this increase has been constant even though our sales have not proportionately grown. Let us consider these items in order.

Under normal conditions **the dealer must be able to make quick deliveries, which require larger stocks,** the active competition necessitates elastic terms of payment. These, together with increased operating expenses, which are always payable in cash, call for a larger invested capital, and in consequence a larger interest account. This also involves a corresponding increase in taxes and insurance. This rule also applies to rentals, as larger stocks require more room, hence more expense. Under present conditions **it is imperative that every successful dealer shall have a large, experienced and efficient corps of salesmen.** Manufacturers of desirable selling lines of machine tools compel their selling agents to cover the territory assigned them systematically and intelligently. To do this is costly both in the matter of salesmen and traveling expenses. A few years ago an inquiry could be answered by mail with a reasonable expectation that an order would follow. Now every important inquiry must be assigned to a competent salesman who must give his whole attention to it until the matter is closed. This involves added expense so that a business of sufficient volume to be profitable needs the service of a number of salesmen. We have also found out that desirable and efficient salesmen are constantly looking for larger salaries which must be paid to retain their services. We all know that we cannot afford to let trained salesmen, who have become familiar with our patrons, selling product and method of doing business go elsewhere, as it is quite difficult and often very expensive to replace them. It has been the experience of our company that we could not afford to keep in our employ salesmen whose services were not growing yearly more valuable, which involved increasing their compensation in the same ratio.

It is also necessary to spend time and money in working up business independent of inquiries that may reach the dealer through the mail or by personal call from the inquirer. Because of this, advertising expenses, which include the cost of catalogues, circulars, etc., are constantly increasing and necessarily so. **Our patrons are becoming more and more alive to their needs and what will supply them, and if we do not acquaint them continuously with our ability to serve them they go elsewhere to make their purchases. We must therefore supplement our salesmen's efforts, not only by the distribution of illustrative and descriptive matter in the shape of catalogues and circulars, but also through the advertising columns of the principal trade papers.**

Handling expenses, including cartage, loss and damage, **are growing disproportionately** to the increased volume of business; loss and damage items are more frequent than formerly. It does seem as if the transportation companies, latterly, have become less careful in handling shipments. The outcome is increased expense to the dealer. These items, directly and indirectly, aggregate a large amount in a year's business.

Telegraph and telephone charges, postage and stationery and office equipment, including salaries, require largely increased outlays yearly. We must have up-to-date methods and equipment for transacting our business. The item of bad debts must not be overlooked. We all have losses of this kind. It sometimes happens that we go for an extended period without any bad debts, and begin to hope that these unpleasant experiences are done with, but alas, we find this is not so. Loss after loss will strike us until the general average is more than maintained. This experience teaches us that we must set aside monthly a considerable amount relative to our net profits to offset this loss. There are many other items of expense, which I have not mentioned here, that during a whole year total no inconsiderable amount. No doubt it is the experience of all our members that the expense account has caused more continuous and perplexing thought than all other matters combined that require attention in our business. We all wish to conduct same on broad and liberal lines; to have everyone associated with us contented and well satisfied; yet we feel that it is only just that we should get a fair return upon the capital invested and reasonable compensation for our work. The dealer is certainly a hard worker, and has long hours whether his efforts meet with success or failure. The expense account is yearly growing. It is true that the volume of business is also increasing, but not in the same proportion. How shall we successfully cope with this situation? What is

*Extracts from paper presented at the semiannual meeting of the National Supply & Machinery Dealers' Association at Detroit, Mich., September 25-26, 1906.

our remedy? Is it not to present this whole matter to the manufacturers whom we represent so that they will see **the necessity of readjusting the resale prices to afford us a larger selling commission, sufficient to protect our reasonable expenses and leave an adequate amount to reimburse us for the capital invested and trained and experienced service rendered.**

We are largely to blame for present conditions. We have gone along from year to year allowing our expenses to mount up while our commissions have been shrinking. Without looking into this matter, we blindly assumed that the increased charges were to be met by increased sales, failing to realize that there must be an increased commission as well. We now have our eyes open. Let us take such action individually and collectively, not hastily but wisely, as will afford us a larger percentage on our gross sales. It is true, business is now very good, and is likely to continue good for some time in the future. We must, however, look out for the lean years, which are sure to come, and be prepared for them.

METAL MARKET

New York Metal Market, November 5.

Copper, Lake	$22.75
Antimony, Cookson's	25.75
Lead	6.00
Spelter	6.35
Straits Tin	43.20

Chicago Iron Market, November 8.

Southern, No. 1 Foundry	$20.40@20.90
Southern, No. 2 Foundry	19.90@20.40
Lake Superior Charcoal	21.00@21.50
Lake Superior Coke Iron, No. 1 Foundry	20.90@21.15
Lake Superior Coke Iron, No. 2 Foundry	20.50@20.90

Chicago Old Metal Market, November 8.

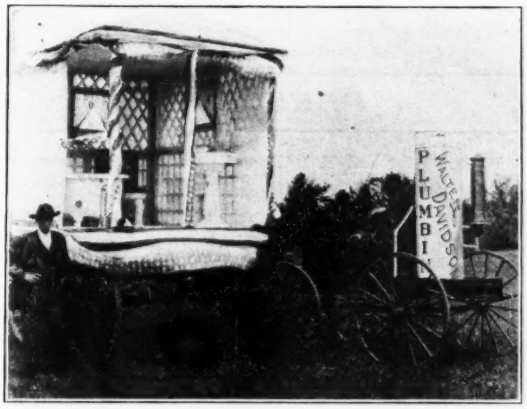
Wholesale dealers' selling prices are about as follows:

Light Copper	$18.50@18.75
Heavy Copper	20.00@21.00
Copper Wire	20.00@21.00
Heavy Red Brass	19.25
Heavy Yellow Brass	15.50
Light Brass	11.25
Red Brass Turnings	15.25
Yellow Brass Turnings	12.75
Heavy Lead	5.75
Tea Lead	5.25
Zinc	5.00

The importation of pig tin into the United States has shown a remarkable gain during the last ten years, as it has grown from a little less than $7,000,000 worth in 1896 to practically $31,000,000 in 1906, having thus more than quadrupled.

The pig iron market is in an unsettled condition, with little doing in the Central West, where there is little available. On the seacoast and the territory tributary to it foreign pig iron is playing an increasing rôle. The English trade papers talk of purchases of warrants for American account aggregating 250,000 tons. This is exaggerated. Shipments so far arranged will foot up to about 17,000 tons, some of which has arrived and is afloat and the balance is to come forward during the next two months. Every plant is being driven at top notch speed, which is reflected in the October records, which are now being published. The mills of the steel corporation record the breaking of 121 records, of which seventy-one are to the credit of the Carnegie Steel Company. With the exception of structural steel the value of orders keeps up at a tremendous rate and runs in excess of current capacity, great as that is.

As the year draws nearer its close it becomes more and more apparent that the increase in copper production for the year 1906 will fall far short of early expectations, says Walker's Copper Letter. For instance, the Lake Superior district will probably send less copper to market this year than it did last, and the increase in the Butte district will not exceed 3 per cent to 5 per cent. There will be a slight increase from Utah and California, and the Bisbee and Globe districts in Arizona will show quite notable increases. Taken altogether it is probable that



Display made by Walter Davidson, of Hinsdale, Ill., in a Fourth of July procession. A model bath room to show what an enterprising man can furnish.

the increase in the world's production will not exceed 5 per cent. In view of the fact that the consumption demand has increased at least 20 per cent this year it is not difficult to understand and appreciate the sensational conditions ruling in the market. Leading Lake Superior producers declare that they would be producing more copper if they could hire more men. The scarcity of labor in that district is most acute. Production is being curtailed in other districts by similar conditions. A strike in the Crow's Nest coal district has made it necessary for the Granby company to close two of its furnaces temporarily. The extensive development work planned in the Bingham district, and at Ely, Nev., is dragging because of the shortage in the labor supply. It would seem now that the anticipated increase next year in the production of several districts must fail of realization. There will, indeed, be cause for much rejoicing if the world's output increases another 5 per cent to 7 per cent in 1907. There is certainly no reason now to anticipate any decline in copper prices for several months to come, at least.

The last expedition to make mineralogical researches in Greenland reports discovery of vast deposits of copper ore at Alar Jarsnak, which it believes may prove the richest and best in the world.

INDUSTRIAL STOCKS

The following are the prices bid and asked on the following industrial stocks, listed on the Chicago and New York Stock Exchanges, at the close of business on Thursday, November 8:

	Bid.	Asked.
American Radiator Co., com	130	132
American Radiator Co., pfd	140	145
American Steel Foundries, pfd	44	45
Amalgamated Copper	111¾	111⅞
Nat. E. & S. Co., com	13	14
National Lead Co., com	76	76¼
National Lead Co., pfd	103½	104
Republic Iron & Steel, com	36⅜	36¼
Republic Iron & Steel, pfd	97½	98
U. S. Cast Iron Pipe Co., com	46⅞	47
U. S. Cast Iron Pipe Co., pfd	89⅝	90
U. S. Steel, com	47½	47⅝
U. S. Steel, pfd	107¼	107⅜

PERSONAL

W. A. Myler and E. L. Dawes gave a stag dinner and smoker to their friends at the Beaver Valley Country Club last evening.

Geo. L. Carroll, formerly with the city auditor's office in Cleveland, has been elected business secretary of the Cleveland Master Plumbers' Association.

E. L. Dawes, of the Standard Sanitary Manufacturing Company, is again attending to business, after having been incapacitated for a couple of weeks.

Andrew H. Brown, the popular New York plumber, announces the marriage of his daughter, Edna Frederica, to Aaron Ennis Aldridge, at Tarrytown, N. Y. Miss Brown accompanied the New York delegation to the Atlanta convention in 1905 and made many friends.

Alfred P. Rosenstock has accepted a position with the Eagle Brass Works, of Detroit, and will call exclusively upon the jobbing trade in its interests. S. D. Rosenzweigg, secretary and treasurer of the company, has recently assumed the management of the company.

Friends of H. H. Hellerman, of the Penn Engineering Company, of Philadelphia, will regret to know that for several months his health has been somewhat poor, and he has been confined to the house on several occasions. He has not, however, permitted his ill health to interfere with his business and is about now as usual.

Arthur E. Stevenson, one of the oldest plumbers in Buffalo, N. Y., and the inventor of the duplex antifreezing valves and hydrants, has recently perfected an automatic electric railroad switch on which he has been working for the past four years. Several railroads have offered him large sums for his patent, but it is understood that Mr. Stevenson will do the manufacturing himself. He thinks seriously of giving up the plumbing business.

Geo. W. Campbell, of the Campbell Manufacturing Company, Gadsden, Ala., has returned to his home after a trip through the central-northern states, which closed at Chicago this week. Mr. Campbell is very much pleased with the prospects for business, and he finds a very keen interest in the trade in his specialties. Improvements are constantly being made in the plant of his company by which a larger and more diversified output may be made. Mr. Campbell has had a wide experience in all branches of the plumbing trade. He was practically educated in the plumbing trade, was engaged in the business as a master plumber for many years previous to his having gone on the road for the Western Brass Manufacturing Company, of St. Louis. More recently he has been representing the "Southern Beauty" line for the Cahill Iron Works at Chattanooga, Tenn., and now that he is engaged in business on his own account all of this varied experience is found to be especially useful.

OBITUARY

John M. Peters, a pioneer in the plumbing business at St. Louis, Mo., at one time as a partner in business with the late W. H. Thompson, president of the National Bank of Commerce, of St. Louis, passed on at his daughter's home, in that city, on Sunday, October 20, in his seventy-ninth year. He had been suffering from a complication of diseases since last February, and the end had been expected for some time. Mr. Peters was born in Blairsville, Pa., and was educated for the engineering profession. In the course of his work as civil engineer he assisted in building part of the Pittsburg & Allegheny railroad, which was the first road west of the Allegheny mountains. Later he moved to Cincinnati, where he engaged in the plumbing business for a time, and later came to St. Louis. He entered the firm of Graham & Thompson and in 1871 bought out Thompson. He later acquired the rest of the business, and for the last thirty years, until his illness, conducted the business alone.

Michael Delehanty, a pioneer plumber of Albany, N. Y., passed on at his home in that city on Friday, October 26, after an illness of less than forty-eight hours. He had been at his place of business on the previous Wednesday afternoon. Mr. Delehanty was one of Albany's substantial business men. Last year he celebrated the sixty-fifty anniversary of his advent into the plumbing business in Albany. He was 86 years of age and leaves seven children. They are Mrs. Edward Murphy, jr., of Troy; Daniel Delehanty, captain United States navy, retired, governor of Sailors' Snug Harbor; John S. Delehanty, of Albany, who succeeded his father in the active management of an extensive plumbing business; Francis B. Delehanty, city court judge, New York City; William E. Delehanty, of New York City, and Mary F. and Helen J. Delehanty. There are thirteen grandchildren and three great-grandchildren, the latter being the children of ex-Mayor Hugh J. Grant, of New York City.

William F. Gay, of the plumbing firm of Gay & Culloton, 50 North Clark street, Chicago, passed on at the Alexian Brothers Hospital on Tuesday, October 30, from locomotor ataxia, with which he had been afflicted for seven or eight years. Mr. Gay was in his fifty-second year and started in the plumbing business on his own account in the early seventies. Later he went into partnership with Thos. P. Culloton, ex-president of the National Association of Master Plumbers, under the firm name of Gay & Culloton, a partnership which lasted for

twenty-one years, or until Mr. Gay's demise. The funeral was held at the St. Vincent's Church on Saturday, November 3, and the burial took place at Calvary Cemetery. Mr. Gay was a member of the Chicago Master Plumbers' Association, which was well represented at his funeral, the following members being in attendance: J. L. Corcoran, L. R. Bain, D. J. Hickey, J. J. Wade, P. Nacey, Chas. T. Byrne, Daniel J. Rock, Chas. J. Herbert, Michael Riley and David Whiteford. Messrs. Riley and Rock acted as pallbearers.

H. C. McElrath, assistant manager of the Western Plumbing Supply Company, 20-22 South Desplaines street, Chicago, passed on peacefully at his home, in this city, on

The late H. C. McElrath, of Chicago.

Thursday afternoon, November 1, from pneumonia and a complication of other diseases, which had confined him to his bed nearly one month. Mr. McElrath, better known as "Mac" among his many friends in the trade, had been connected with the plumbing supply trade since he left school at the age of fifteen, when he entered the employ of the A. Y. McDonald & Morrison Manufacturing Company, of Dubuque, Iowa, his native city, with which company he remained seven years, or until 1895, when he came to Chicago to fill a more important position with the A. Y. McDonald Company, on East Lake street. In 1901 he severed his connection with the A. Y. McDonald Company to accept the position with the Western Plumbing Supply Company, which he held until his demise. His early decease, he was only 33 years old, is greatly regretted by his many friends both in and outside of the trade. He is survived by his wife. His burial took place at Dubuque, Iowa, on Sunday, November 4.

ASSOCIATION NEWS

Baltimore, Md.—The Atlantic Coast Association of Master Plumbers will meet in annual convention in this city on Monday and Tuesday, December 3 and 4.

Boston, Mass.—The Master Plumbers' Association of Boston and Vicinity has entered into a new agreement with the Journeymen's Union, No. 12, which is to go into effect on May 1, 1907, in all shops employing members of the union. The agreement is as follows:

PART I.—WAGES.—The minimum rate of wages for Journeymen shall be at the rate of $4.40 per day, on the hour basis (55 cents per hour), 75 cents per hour for a night shift, when night and day shifts are employed on time limit contracts. All other overtime at the regular double time rate.'

PART II.—HOURS OF LABOR.—Eight hours to constitute a day's work for the first five days in each week, and four hours Saturday. The employers have the privilege of working a man Saturday afternoon in emergency cases, such as bad leaks, etc., until 5 o'clock, without paying double time.

PART III.—OUT OF TOWN WORK.—The time limit for leaving city on out of town work to be 7 o'clock a. m., where it is necessary to do so to get to work at 8 a. m., and that the Journeyman shall return not later than 6 p. m., by the quickest and shortest route.

PART IV.—PIPE CUTTING.—All pipes 2 inches and under for vents, supplies, etc., shall be cut by the plumbers, except waste pipes where recess fittings are used.

PART V.—BOARD AND TRANSPORTATION.—When a Journeyman plumber is sent to a job outside the city of Boston, and it is necessary to be absent from home, the Master Plumber shall pay the board of the Journeyman, or furnish transportation to and from the job each day.

PART VI.—PAYMENT OF WAGES.—It is agreed that all members of the local shall be paid in full by 12, noon, Saturday of each week.

PART VII.—AGREEMENT EFFECTIVE.—This agreement to go into effect May 1, 1907.

The entire character of the National Association of Master Plumbers of Great Britain is about to be changed. A meeting was held in Manchester on Wednesday of this week, at which it was hoped it would be possible to complete arrangements for the transference of the powers, responsibilities and functions of the National Association of Master Plumbers to a new organization, which is to be called the Institute of Master Plumbers. The National Association of Master Plumbers was founded in 1895, and local associations in fifty-five towns have been affiliated with it. **Education is to be one of the chief aims of the new society,** and it is reported that while trade protection will be made prominent in the early history of the association, it is likely it will gradually be pushed into the background, and that the Institute will be conducted on the lines now so well known in similar institutions, such as the Institute of Mechanical Engineers and the Institute of Civil Engineers. It is expected that the institute will undertake the standardization of plumbing goods.

THE LABOR FIELD

Hot Springs, Ark.—The Master Plumbers' Association will run open shops hereafter.

Tacoma, Wash.—The master plumbers of this city have declared for an open shop and no more negotiations will be carried on by them with the union. They say they want to be fair with their men, but cannot stand to have the entire management of their business taken out of their hands. The strike which caused them to take this step began on October 11. The journeymen were getting $5 a day and asked for higher wages and certain restrictions oencerning the employment of apprentices, when these demands were not conceded to the strike followed with the above result.

BUSINESS VENTURES

Blue Earth, Minn.—Ward & McGuiggan have opened a branch plumbing establishment in this city.

Barbourville, Ky.—Robert L. Putnam will soon open a plumbing establishment in the old Postoffice building.

Chicago, Ill.—John H. Sullivan, of 328 East Division street, has incorporated his plumbing business under the name of the Jno. H. Sullivan Plumbing Company. The capital stock is $4,500.

Portland, Me.—The Wales Collier Heating & Engineering Company has ben incorporated, with a capital of $100,000. W. E. Dunham, of Portland, is president and treasurer of the company.

BUSINESS CHANGES

Edgerton, Kan.—W. M. Rossner has sold his plumbing business in this city.

Garnett, Kan.—Carnutt Brothers have sold out their plumbing business in this city.

Minneapolis, Minn.—It is reported that the plumbing firm of Jandro, Hase & Co. has been dissolved.

Bisbee, Ariz.—The name of the plumbing firm of E. G. Ord Company has been changed to the Sanitary Plumbing Company.

Benson, Minn.—The dissolution is reported of Davidson & Strand, plumbers of this city, and Mr. Strand will continue alone.

Bellefonte, Ohio.—P. Rutledge will soon move his plumbing establishment into his new building now being erected on West Columbus street.

Weatherford, Tex.—The plumbing firm of the W. S. Baertich Company, of Marshall, Tex., has moved its stock and fixtures to this city and will hereafter conduct its business under the name of the City Plumbing Company.

Calumet, Mich.—W. T. McFadden has purchased an interest in the Peninsula Plumbing & Heating Company. Mr. McFadden has just resigned his position with the Carlton Hardware Company, which he has held for ten years.

Wilkinsburg, Pa.—Johnson H. Conard, a plumber, has filed a voluntary petition in bankruptcy. He shows that he has liabilities amounting to $3,866 and assets $3,996.

CONTRACTS AWARDED

Blanchester, Ohio.—H. C. West has secured the contract for the plumbing in Walter Hixson's new residence.

Batavia, Ill.—W. L. Grimes has secured the contract for heating and plumbing Logan Gridley's new residence.

Waverly, Ia.—Biggs & Moore have received the contract for the plumbing and heating work in the Orphans' Home.

Webster City, Ia.—A. F. Mueller has the contract for the plumbing and heating plant for the new armory building.

Pittsfield, Mass.—H. L. Doran has secured the contract for the plumbing and heating in the new synagogue on Linden street.

McKeesport, Pa.—William Osterwald has awarded the plumbing contract for three fine residences in this city to John A. Stickrath.

Nankin, O.—H. A. Roberts has secured the contract for the installation of a steam heating plant in W. D. Edgar's residence.

Ames, Ia.—Horton & Steigerwalt have been awarded the contract for plumbing the high school building. The consideration is $1,550.

Pittsfield, Mass.—D. W. Bovett has been awarded the contract for the plumbing in Berkshire Life Insurance Company's new building.

Worcester, Mass.—O. S. Kendall & Son have been awarded the contract for remodeling the plumbing and heating in L. B. Stone's residence.

Waterbury, Conn.—J. J. Crimmins has secured the contract for the plumbing in Miss Anna Healey's new tenement building on Baldwin street.

Worcester, Mass.—W. H. Toner & Co. will do the plumbing and Edwin Hawes & Co. the heating in the new addition to the Union avenue school.

Westfield, Mass.—Woronoco Plumbing & Heating Company has been awarded the contract for the plumbing in George B. Sackett's house on King street.

Holyoke, Mass.—E. H. Friedrich has been awarded the contract for the plumbing and gasfitting in William J. Cray's new apartment block on Walnut street.

Washington, Iowa.—Arthur Brothers have secured the contract for the installation of the steam heating plant in the new school building at Blakesburg, Iowa.

Washington, Ill.—William Schelm has secured the contract for the installation of a new steam heating plant in the plant of the Acme Railroad Signal Works.

Marshalltown, Ia.—The McCarten Plumbing Company has been awarded the contract for plumbing and gasfitting the new Sieg. Armbruster building on West Main street.

Pittsburg, Pa.—The plumbing contract for the new store and apartment building at Forbes and Ophelia streets for David Davis has been awarded to W. J. Elkins, 614 Penn avenue, Wilkinsburg, Pa.

Red Jacket, Mich.—F. Distel has been awarded the contract for remodeling the plumbing and heating in the

large apartment building on the corner of Sixth and Scott streets.

Lynn, Mass.—J. S. Morgan & Son have secured the contract for the plumbing in D. W. Basker's business block.

Providence, R. I.—W. J. Fogarty has been awarded the contract for the plumbing in the new field house for Brown University.

Guthrie, O. T.—W. T. Powers has been awarded the contract for the installation of a heating plant for the Agricultural School buildings at Langston. The consideration is $9,000.

Bellevue, Pa.—Harvey Lewis, Jr., of Avalon, has been awarded the plumbing contract for a block of eleven fine residences here. The owners are Westhead & Evans, of Pittsburg.

Canton, Ohio.—The plumbing, heating and electric lighting contracts for the addition to the County Infirmary have been awarded to W. D. Theobald & Co. The contract price was $3,130.

Edgar, Neb.—The Lewis & Kitchen Company, of Kansas City, Mo., has been awarded the contract for the installation of a heating plant in the Whittier school. The consideration is $2,700.

Hartford, Conn.—The Vanderman Plumbing & Heating Company, of Willimantic, has secured the contract for the installation of the plumbing in the Whitney Manufacturing Company's new plant.

New London, Wis.—W. T. Patterson & Co. have been awarded the contract for the installation of the plumbing and heating in the new North Division school building. The price of the contract is $3,100.

Batavia, Ill.—The contracts for the plumbing of the new residences of T. S. Fauntleroy and Robert Fauntleroy have been awarded to Ruddy & Co. The erection of these two residences will amount to about $100,000.

Pittsburg, Pa.—The plumbing contract for the large business and apartment building that is being erected for Peter Dilillo on Larimer avenue has been awarded to Charles M. Swift, of 807 Penn avenue, Wilkinsburg.

Owatonna, Minn.—The Clefton Heating & Plumbing Company has been awarded the contract for the heating of three cottages and the main building at the State Public School, in this city. The contract amounts to $4,760.

Buffalo, N. Y.—The plumbing and heating job in the new Chamber of Commerce Building, on Main street, is being done by C. A. Criqui. This is one of the largest contracts which has been let in Buffalo in a long time.

Worcester, Mass.—Field & Fielder Company has been awarded the contract for the plumbing in the new addition to the convent on Prospect street. Edwin Hawes & Co. will install the heating system in the same building.

Ft. Wayne, Ind.—A. Hattersley & Sons have secured the contract for the installation of plumbing, steam heating and electric wiring in the new wing at the county poor farm. The consideration is $1,212.38. There were no other bidders.

Fayette City, Pa.—Brown & Farris, of this city, have been awarded the plumbing contract for the plumbing system for the fine new Young Men's Christian Association building that is under course of construction here. A large number of fine fixtures will be installed.

BOWLING NEWS

The Pittsburg Jobbers' Bowling League made some high scores last Monday night and the games were the closest of the season so far. The surprise of the evening was the defeat of the Bailey-Farrell Manufacturing Company, the Standard Manufacturing Company taking one game from them. This was the first defeat of the season for the Bailey-Farrell Manufacturing Company's team. A new high individual record for the season was made by Mr. Tuohy, of the Ruud Manufacturing Company's team, this player hanging up the fine score of 233, and closing the evening with the average of 195⅓. The results were as follows:

Ruud Manufacturing Company	708	727	828
Kelly & Jones Company	771	769	762
Pittsburg Supply Company	812	832	871
Harris Pump & Supply Company	673	618	626
Monarch Water Heater Company	674	697	805
Standard Sanitary Manufacturing Company	676	680	727
Duquesne Sanitary Company	673	781	692
Iron City Sanitary Manufacturing Company	638	596	690
Standard Manufacturing Company	697	805	765
Bailey-Farrell Manufacturing Company	723	701	791

Larry Bannon, of Kingston, N. Y., entertaining his friends, Mrs. John Delaney, of New York City; Miss McCarron, of New York City, and Miss Thompson, of Brooklyn.

Another bowling league will be formed within the course of a few weeks by the master plumbers of Pittsburg and Allegheny. A meeting was held last week, and this decision was reached. In all probability there will be six teams in the league, two from the East End, two from downtown and two from Allegheny. There has been so much interst manifested in bowling by the plumbers that they decided to form a league of their own after the

jobbers got together and formed a league some weeks ago. A meeting will me held in a few weeks at which all arrangements will be completed, including the adoption of a schedule. Games will be bowled every week. D. G. Deely and Max Snively are taking an active interest.

The Philadelphia Plumbing and Steam Supply Bowling League has rolled several very close and exciting games, which is the more noteworthy as this is at the very beginning of the season and it promises well for a successful and interesting tournament during the winter. The games are played at the Terminal Alleys, and Secretary Robert G. Savill's score cards show the following results for the games played Monday evenings, October 22 and 29:

October 22, 1906.

	1st Game.	2d Game.	3d Game.
Standard Plumbing Supply Co.....	727	697	772
Froelich Bros.....	712	729	720
Walls, Owen & Pearsall Co.....	806	788	881
Haines, Jones & Cadbury Co.....	819	793	846
Salesmen	761	691	792
Picked Team	678	686	638

October 29, 1906.

Fleck Bros. Co.....	716	725	676
Froelich Bros.....	638	677	764
Haines, Jones & Cadbury Co.....	773	708	805
Standard Plumbing Supply Co.....	638	786	782
Walls, Owen & Pearsall Co.....	869	720	746
Salesmen	816	853	828

CHANCES FOR BUSINESS

Jobbers and manufacturers are requested to send catalogues as indicated to the parties whose names and addresses are given below. This request does not necessarily involve quotation of prices and discounts: Max Morlock, 205 East Second street, Long Beach, Cal., catalogues of plumbing supplies.—H. C. Bullock, 1555 Eighth street, Oakland, Cal., catalogues of plumbing supplies, plumbers' brass goods, water closet combinations, plumbers' and steamfitters' tools, gas, electric and combination fixtures.—Naldrett & Brennan, 23 Coso avenue, San Francisco, Cal., catalogues of plumbing supplies.—George B. Woodruff, Day avenue, Suffield, Conn., catalogues of plumbing and heating supplies, plumbers' and steamfitters' tools, pipe and boiler coverings.—J. H. Schaefer, 4047 North Clark stret, Chicago, catalogues of gas, electric and combination fixtures.—The Hanley-Casey Company, 37 East Ohio stret, Chicago, catalogues of plumbing and heating supplies, plumbers' brass goods, steam brass goods and water closet combinations.—The George A. Weld Company, 41 Lincoln street, Boston, Mass., catalogues of plumbing and heating supplies.—J. P. Cunningham & Co., 195 Mill street, New Bedford, Mass., catalogues of gas fixtures, plumbers' and steamfitters' tools.—William L. Scheidt, Box 235, Kutztown, Pa., catalogues of plumbers' supplies and brass goods, plumbers' and steamfitters' tools.—H. W. Pharaoh, Lansdowne, Pa., catalogues of plumbing supplies, water closet combinations and porcelain enameled goods.—Weidemann Brothers, 3013 Kensington avenue, Philadelphia, catalogues of heating supplies and porcelain enameled goods.—William P. Cooke, 3432 Germantown avenue, Philadelphia, catalogues of water closet combinations and porcelain enameled goods.—The We-heat Engineering Company, 203 Walnut place, Philadelphia, catalogues of heating supplies, plumbers' and steamfitters' tools, pipe and boiler coverings.—Samuel C. Backman, 154 South Sixth street, West, Salt Lake City, Utah, catalogues of plumbing supplies.—Elmer Belville, 82 Elm street, Barre, Vt., catalogues of plumbers' and steamfitters' tools.—F. M. Foss, 68 East State street, Montpelier, Vt., catalogues of plumbing and heating supplies.—J. W. P. Eagle, Ronceverte, W. Va., catalogues of plumbing, heating and mill supplies.—Alexander Zeck & Son, Grafton, W. Va., catalogues of plumbing and heating supplies, plumbers' and steamfitters' tools.—Arthur E. Parent, 32-36 Main street, Berlin, N. H., catalogues of plumbing, heating and mill supplies, plumbers' brass goods, steam brass goods, belting and packing, water closet combinations, porcelain enameled goods, plumbers' and steamfitters' tools, gas, electric and combination fixtures, pipe and boiler coverings.—Stallman & Snyder, 485 East Main street, Rochester, N. Y., catalogues of plumbing and heating goods.—O. Picard & Fils, 199 St. John street, Quebec, Canada, catalogues of plumbers' supplies and brass goods.—John Watson & Co., 4145 St. Catherine street, Westmount, P. Q., Canada, catalogues of plumbing, heating and mill supplies, plumbers' brass goods, steam brass goods, water closet combinations, porcelain enameled goods, plumbers' and steamfitters' tools, gas, electric and combination fixtures, pipe and boiler coverings.

CONTEMPLATED WORK

Denver, Col.—Plans are being prepared under the direction of Building Inspector Willison for a public bathhouse in this city. It will contain twelve bath tubs, twenty-five shower baths and a swimming pool, 40x65 feet.

Walla Walla, Wash.—Sealed proposals will be received by City Clerk T. D. S. Hart until 4 o'clock p. m., November 20, for the furnishing and erection of a steam heating plant in the city hall and fire engine house in accordance with plans and specifications.

TRADE LITERATURE RECEIVED THIS WEEK.

From the Gurney-Massey Company, Limited, Montreal, Quebec. Pocket catalogue for 1906-07; 6½x3⅝ inches; 178 pages.

From James B. Clow & Sons, Chicago, Ill., catalogue 12x9¼ inches; paper-bound; showing automatic water closets; 18 pages.

From the Board of Trustees of the Sanitary District of Chicago, annual message of President Robert R. McCormick, October 11, 1906.

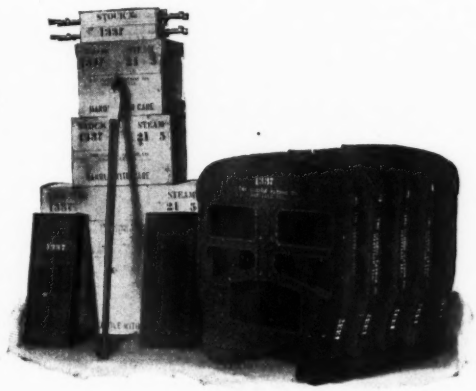
From the American Radiator Company, Chicago. Cover of Collier's Weekly, showing three-page advertisement (in color) of Ideal boilers and American radiators.

From the Consolidated Engineering Company, Chicago, Ill., envelope containing illustrations of large buildings and institutions in which their goods have been installed.

Meriden, Conn.—The plumbing establishment of Taylor & Taylor suffered a loss of about $4,000 in the $35,000 fire which visited this city last week.

11-'06 Shipments.

We are giving November commands for IDEAL Boilers and AMERICAN Radiators the right quick send-off, which is the key-note of satisfaction to the heating business when its feet are on Winter's threshold. Our percentage of promptness is higher than ever this year.



Ideal Sectional Boiler ready for shipment.

30 warehouses throughout the continent daily being replenished by 10 active Plants mean ample stocks, assortments and quick shipments all the year around.

AMERICAN RADIATORS & IDEAL BOILERS

AMERICAN RADIATOR COMPANY

General Offices: 282-284 Michigan Avenue, Chicago.

New York, 104-108 West 42nd Street.
Boston, 129-131 Federal Street.
Philadelphia, 1342 Arch Street.
Baltimore, 109 E. Lombard Street.
Buffalo, Court and Franklin Streets.
Pittsburg, 601-603 Hartje Building.
Cincinnati, 213 W. Fourth Street.
Chicago, 282-284 Michigan Avenue.
Milwaukee, 126 Sycamore Street.
Indianapolis, 511 Lemcke Building.
Detroit, 225 Jefferson Avenue.
St. Louis, Olive and Fifteenth Streets.
Atlanta, 11 North Forsyth Street.
Omaha, 413-417 South Tenth Street.
Minneapolis, 229 Fifth Street, South.
Kansas City, 313 East Tenth Street.
Denver, 831 Fifteenth Street.
Seattle, 1215-1216 Alaska Building.
San Francisco, Monadnock Building.
London, E. C., 89-90 Shoe Lane.
Paris, 24 Rue de Mogador.

A House Without a Chimney

Will the Twentieth Century see the passing of that cumbrous destroyer of artistic symmetry in dwelling houses—a chimney? Will it become a useless feature in the homes of the future? Stranger things have come to pass, yet we, accustomed to the methods in vogue for centuries, may have given the matter no thought. So used have we become to the employment of coal or wood for heating and cooking that an eventual release from the annoyance of smoke, ashes and dust has never occurred to us. Yet the problem of doing away with this form of fuel has been solved and a house without a chimney has made its appearance, says the Architects' and Builders' Journal. Electricity has made the departure from the ordinary possible. When Mr. H. W. Hillman, a prominent official in the General Electric Company's works at Schenectady, N. Y., commissioned an architect to draw plans for his handsome suburban residence, without chimney or flues, he rather astonished that gentleman until it was explained that electricity, which was to be used

M. M. Berger, of Glauber Brass Mfg. Co., of Cleveland, with his friends Mr. and Mrs. William Bayles, of Harrisburg, Pa.

exclusively, rendered those adjuncts superfluous. The house was built and it has the unique distinction of being the only residence in America without a chimney. Electricity furnishes the light, supplies heat in ornamental radiators, does the cooking and operates numerous other devices of utility and comfort. It illustrates the advance made in the utilization of this comparatively unknown element. With new inventions which will lessen the cost of generation and appliances to enlarge the scope of its adaptability, electricity is destined to become a commodity of general use as a domestic as well as an industrial agent. Before the present century runs the half of its circle, chimneyless houses may, nay, will be, no novelty. The increasing cost of coal to the consumer will direct attention to a cheaper substitute which will be safe and satisfactory. This electricity will supply. New devices by which the current is controlled has minimized the danger which among the uninformed has been an objection to its use for home purposes. The masses, however, are becoming educated in the management of the safeguards about electric current, and with the exercise of ordinary intelligence it is harmless and less dangerous than coal, gas or the oils so extensively used as fuel at present. In planning buildings in the future, whether pretentious or humble, wiring for electricity will be an essential requirement, just as gas and water piping is today. We have scarcely entered upon the age of electricity. Looking backward to the beginning of the second half of the last century, we marvel at the wonders of electrical achievement. Gauged by the development of the past decade, we are but passing through the kindergarten period of electrical experience.

Refrigeration By Electricity

Among the many conveniences that are available in a town having a public supply of electric current is the small self-acting refrigerator by means of which hotels, clubs, shops and refreshment rooms may preserve perishable foods, and cool drinking water and liquors without the assistance of a daily ice supply and free from all the fluctuations that seem to be an accompaniment of the ice trade. The Scientific American gives the following interesting account of what has already been done with this new appliance:

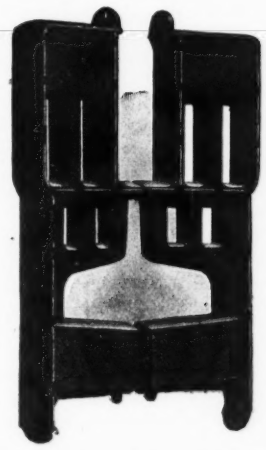
Ever since the perfection of the cold storage plant, money and brains have been expended in producing an iceless refrigerator. It was generally conceded that there was a demand on the part of dairymen, soda fountain proprietors, saloon keepers, butchers and grocerymen for something that would make them independent of the iceman, and this seems at last to have been accomplished. Besides being a great convenience, the refrigerator has a number of other recommendations, notably in cleanliness. Because of the great amount of moisture in the interior of the refrigerator, and because of the material usually stored within, the walls tend to become foul unless cleaned with scrupulous care at frequent intervals. This condition is brought about all the more quickly where the ice is not pure. Moreover, the charging of the ice receptacle every day is a nuisance. All this is done away with by means of electric refrigeration.

The electric refrigerator is a self-contained and automatic cold storage plant in a small way. It almost takes care of itself. The switch controlling the electric current is the only part that must be manipulated. A refrigerator of this kind has been in operation for some time as an experiment in a Philadelphia grocery store. When the store is opened in the morning, the current is turned on and remains so during the day. Although the box is being constantly opened and closed, the temperature is maintained at 34 degrees. About the best temperature obtainable by the ordinary method of icing is 40 to 42 degrees. When the store is closed for the night, the current is shut off, and the temperature remains constant all night. The difference shown by the mercury between the closing and opening hours is never more than 1 degree. During all this time no operating expenses whatever have been incurred. The largest soda fountain in Philadelphia has been in operation for several months,

CAPITOL BOILERS AND RADIATORS

Capitol Talks No. 5

BRIDGE WALL SECTIONS



In designing the Capitol Boiler we had constantly in mind the idea of making it adaptable to widely varying conditions. When it is desirable to provide a boiler with small grate area in proportion to fire surface, bridge wall sections may be used to cut off the grate at any point necessary to meet the conditions. We fit all Capitol Boilers with bridge wall sections placed at a fixed point; we adjust the bridge wall section in the Heavy Duty to any point you specify in your order. : : : : : :

We have an instructive catalogue that is a handsome example of the printers' art. A postal card request brings one to you : : : : .

United States Heater Company

Home Office and Works: Fort St. & Campbell Ave. DETROIT, MICHIGAN.

Branches:
New York; 129 Worth St.
Chicago; 42 Dearborn St.
Kansas City, Mo.; 114 W. 11th St.
Omaha, Neb.; 419 S. 15th St.

Sales Agencies:
Boston, Mass. J. H. CUNNINGHAM & CO.,
Denver, Colo. KELLOGG & STOKES STOVE CO.,
Minneapolis, Minn. PLUMBING & S. F. SUPPLIES CO.,

and the materials drawn therefrom have been uniformly several degrees colder than could be secured with the use of shaved ice, and yet no ice has been used in it. A motor of ½ horsepower in the cellar operates a refrigerating plant, which not only keeps the fountain at a frigid temperature, but also does some additional work of a similar character in the cellar. The iceless refrigerator is much the same in appearance as any large refrigerator. In a compartment at one end a motor and all the necessary compressors and other paraphernalia are contained. The place usually occupied by the ice is given over to a tank containing brine, which is the means of cooling the interior of the refrigerator. The principle is identical with that of the large refrigerating establishments, but this is the first time that the system has been reduced to an automatic basis. No expert knowledge of either electricity or refrigeration is required in order to operate one of these outfits. The types now being manufactured are of the sizes which are likely to be required by storekeepers, who would ordinarily make use of at least 200 pounds of ice daily. The next step will be the manufacture of one which will be available for the larger householder, and will be operated by a motor of ⅛ horsepower. Another notable feature of one of these equipments is that where it is desired to have ice for use on the table, these machines will make it while performing their ordinary functions. One of the refrigerators has facilities for making two 10-pound pieces of ice per day, and another with a little different arrangement will make a number of small cubes.

Loyal Helpfulness and Zeal Wins

A commercial organization, whether it be great or small, is strong or weak according to the degree of harmony which exists among its working units. The firm or corporation which seeks advancement along the lines of least resistance must see that each unit is attuned in perfect harmony with the whole. From the humblest office boy to the highest officer, each member of the organization is a unit to be considered. Just how to establish and maintain the proper relationship of each individual with his fellows in the department to which he belongs, and then, in turn, the relationship of one department to the other, is the problem which many concerns are endeavoring to work out satisfactorily.

No employe can best serve the firm or corporation on whose payroll his name appears unless his sympathies are in full accord with the policy and purpose of the management. He must be led to preserve the right attitude toward the organization as a whole. At the same time he should realize that his best progress depends solely on himself—that he must always deserve more than he is paid in wages. He must feel in his heart that his employer's interests are his own.

Standing or Falling on Merit.

In order to present a few practical suggestions, let us take as an example a concern that manufactures and sells what is generally referred to as a high-class specialty. Each department head is held responsible for "results." In turn, the head must look to each individual in his department for the faithful discharge of certain duties which have been clearly outlined to him. The use of the "duty book," containing a specific outline of the duties of the individual, is recommended. Space should be left for inserting additional duties from time to time and special rulings concerning the work. Individual responsibility should be the keynote of each department. This plan gives each one the opportunity to stand or fall on his own merits. No fair-minded person will ask for more. Besides, the plan appeals to the best there is in the individual and acts as an incentive to better work.

Each department head is required to hold regular meetings of his people at least twice each month. At these meetings the work, the purpose, of the department may be discussed by all. The head calls for complaints, suggestions, criticisms. Is John's work hindered by some fault in the methods pursued by Frank? Are certain figures, for which the department must look to another department, unduly delayed? These and countless other questions arise. Loyalty, enthusiasm, ambition to do more and do it better, are engendered and fostered. Mistakes, which cost money, are reduced in number and consequence. Each one grows to understand and appreciate the difficulties of the others. Above all, each understands just what is required of him and what "our company" is trying to do.

Conferences and Promotions.

Department heads are called together at regular intervals to consult in regard to their relations with each other and the business in general. The business or office manager presides, and he, too, calls for complaint, suggestion, criticism. "Too many errors in your department of late, Mr. Smith." "Why were your reports delayed last month, Mr. Blank?" And so on. Each comment and question provokes discussion. Opinions and experiences are exchanged. Each head goes back to his department better equipped to accomplish that which is expected of him. "I must improve our method of recording orders," he thinks.

Each head of a department endeavors to strengthen the personnel of his force. The business manager looks to him for a constantly increasing flow of good results. He cannot stand still or fall behind the other departmental heads. He must grow with the business and go forward always. Therefore, he must build up the departmental organization of which he is chief.

Promotion from the ranks is most desirable. To make this practicable each position must have its understudy. Too many employes carry valuable knowledge of facts and figures around in their heads. This knowledge is the property of the company. Each employe should thoroughly understand the duties of at least one other position than the one he holds. Each one should be made to realize that his promotion depends to a great degree on this feature. He must understand that his chances for advancement are far greater when, through his assistance and coöperation, a fellow employe is made competent to take charge of his work should he be required elsewhere. Thus quick changes may be made without hitch or hindrance.

Unload! Let no chief do that which his subordinate can do as well, thus leaving him free for more important things. Many a strong and capable man, yes, even the head of the business, is worrying over petty details which properly belong to the rank and file. Men who refuse to unload usually plead that they "must keep in touch with things." Meanwhile the business suffers because the chief can't look ahead. His nose is in his desk. Unload! You'll be surprised how well your desk chair will fit your assistant!—A. C. Harris, in American Industries.

THE OPEN SHOP.

In the World's Work for December, Isaac F. Marcosson describes the battle for the open shop and thus sums up the results of the year's work of the associations of employers:

The end of the year finds a bristling battle line between employer and employe extending to nearly every State. The large results of the fight for the open shop are these:

1. The employer has learned the value of organized opposition to excessive union demands and is securing control of his shop or business.

2. The power of the walking delegate as a disturber of peace and industry is passing.

3. The non-union worker now knows that he can be protected in his constitutional right to work where he pleases.

4. Organized labor is on the defensive instead of the offensive.

5. The labor agitator has been taught to respect the law.

The employers do not maintain nor wish that labor unions should be destroyed; nor do they question the right of temperate and constructive (not destructive) organization.

THE ANNUAL ORDEAL.

Hear him splutter,
Hear him cuss;
Listen to his
Awful fuss.
Like unto a
Bull he roars
As he clangs the
Iron doors.
Oh, what dreadful
Talk, egad!
Holy smoke, but
He is mad.
Bitter is his
Earthly cup;
Dad has fired the
Furnace up!

—Philadelphia Bulletin.

PATENTS

833,420. Stop-Check Valve. Louis Schutte, Philadelphia, Pa., assignor to the Schutte & Koerting Company, Philadelphia, Pa., a corporation of Pennsylvania.

833,466. Water Heating and Circulating Apparatus. Peter J. Kolich, Oakland, Cal.

833,492. Gas-Fixture and Mirror-Support. Launy Van Horn, Letts, Ia.

833,516. Pipe-Wrench. Malcolm G. Ewer, Detroit, Mich.

833,527. Needle-Bath Apparatus. Samuel J. Jackson, New York, N. Y.

833,613. Pipe-Hanger. Charles P. Maiser, Pittsburg, Pa.

833,662. Device for Fastening Gas-Pipes. Edward Bartholomay, Rochester, N. Y., assignor of one-half to Harry Duryea, Rochester, N. Y.

833,681. Flushing Apparatus. John Denton, Paterson, N. J.

833,777. Steam-Trap. Thomas J. Cookson, Cincinnati, O.

833,891. Heating System. Andrew G. Paul, Boston, Mass.

833,939. Straightway Valve. William T. Rider, Coxsackie, N. Y.

834,068. Lubricator. Charles E. McCaffrey, Winsted, Conn.

834,216. Pipe-Wrench. Adolf Meierhoff, St. Louis, Mo.

834,256. Flushometer. Robert A. Brooks, Chicago, Ill.

834,286. Automatic Blow-Off Device for Condensation-Water. Léon Fondu, Chappelle-lez-Herlaimon, Belgium.

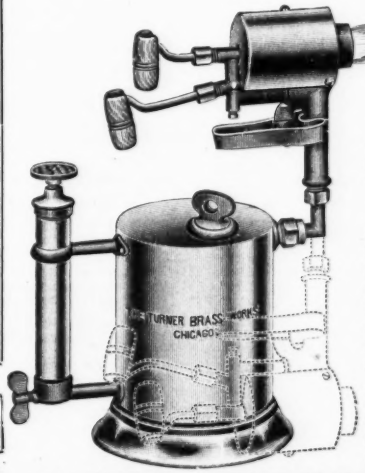
834,362. Pipe Connection. Alonzo W. Cram, Haverhill, Mass.

834,364. Radiator. James H. Davis, Chicago, Ill., assignor to American Radiator Company, Chicago, Ill., a corporation of New Jersey.

834,444. Water-Heater. Charles M. Bausher and Amos C. Myers, Greentown, O.

834,618. Pipe-Coupling. Austin T. Herrick, Bradford, Pa.

834,784. Valve. Joseph J. Wilber, Perth Amboy, N. J.



FORCE

You cannot force a business man to buy a thing he doesn't want.

PLUMBERS

everywhere wouldn't buy this torch if we had to use force to sell it. A trial will convince you that the Turner Double Jet Torch has no equal where a VOLUME of work or INTENSE HEAT is required. Will work perfectly out of doors.

You will appreciate our catalogue on the subject. May we send it to you today.

Price $5.50 NET

TURNER BRASS WORKS, CHICAGO
43 North Franklin Street

ORDER
Shirley Radiators
P. D. Q.
PRICE DELIVERY QUALITY
Shirley Radiator & Foundry Co.
INDIANAPOLIS, IND.
Ask Your Jobber

Domestic Engineering

Published Weekly by Domestic Engineering (Incorporated), $1.00 a Year, 5 cents a Copy. Office: 58-64 North Jefferson Street, Chicago. Tel. Monroe 816.

Advertising—Copy and cuts for advertisements should be received by the last day of the week preceding publication. We cannot guarantee insertions or changes in advertisements if received later.

Entered in the Postoffice in Chicago, Illinois, as mail matter of the second class, Dec. 12, 1901.

November 10, 1906

Classified Advertisements

The rate for advertising under this heading is 10 cents a line an insertion. The average advertisement runs six words to a line. To insure insertion in this column copy should be received not later than Wednesday afternoon. If received before Thursday evening, advertisements will be inserted under the heading "Late Classified Advertisements" on page 138.—One man from Omaha writes: "I feel on good terms with Domestic Engineering, for it was through answering an ad in the 'Trade Wants' column that I am now located in the hustling western country, having come here from New Jersey."

Help Wanted.

WANTED—FIRST CLASS TINNER; steady work and good wages. James Dunneen, Greenwich, Conn. tf

WANTED—AT ONCE, SEVERAL FIRST class plumbers; steady jobs for the right men. Scale, 45c per hour. No labor trouble. Address The Carson-Payson Co., Danville, Ill. 11-17

WANTED—YOUNG MAN FAMILIAR with plumbing goods as assistant shipper. Apply with references to Cambridge Plumbing Supply Co., 45 Harvard St., Cambridge, Mass. tf

WHY NOT YOU? OTHER SALESMEN are making money selling my specialty to plumbers. Sample goes in vest pocket. Good side line. Write to Fred Schulder, 613 St. Clair Ave., N. W., Cleveland, O. 10-27

WANTED—A COMPETENT MANAGER of plumbers' woodwork plant to act as manager and take full charge of factory; state experience and salary expected. Address Plumbers Woodwork Co., Algoma, Wis. tf

WANTED—FIFTY NON-UNION plumbers for Kansas City, Mo. Apply or write John G. Mallon, Secretary Master Plumbers' Association, Employers' Association Rooms, 1121 Grand Ave., Kansas City, Mo. tf

WANTED—SALESMAN HAVING ESTABLISHED trade amongst the plumbers to carry side line of water heaters on commission basis; those meaning business only need answer. Address Manager, 4425 Lorain Ave., Cleveland, Ohio. 11-10

WANTED—THREE SALESMEN TO sell steam specialties, also pipe and fittings, in Chicago and vicinity. Large and well known line. Don't apply unless you are a hustler and thoroughly experienced. Expenses and commission. Apply to 581, "Domestic Engineering," Chicago. 11-10

Situations Wanted.

WANTED—POSITION AS ESTIMATOR and foreman in plumbing and heating establishment; also understand hot air heating; would invest capital and take an interest in a paying business; have had twenty years' practical experience. No. 586, "Domestic Engineering." 11-17

NON-UNION PLUMBER WITH FIVE years' experience, good references and good habits, desires position where he can demonstrate his desire to do good work; is thoroughly qualified in plumbing and gas fitting and knows considerable about steamfitting. Address 590, "Domestic Engineering," Chicago. 11-10

SALESMAN HAVING SPLENDID ACQUAINTANCE WITH THE JOBBING TRADE THROUGHOUT THE MIDDLE WEST AND EASTERN STATES AND POSSESSING THOROUGH KNOWLEDGE OF BRASS AND IRON GOODS, PLUMBING AND STEAM SUPPLIES, WILL BE OPEN FOR POSITION JANUARY 1; HIGH CLASS REFERENCES AS TO ABILITY, CHARACTER, ETC. ADDRESS, 593, "DOMESTIC ENGINEERING," CHICAGO. 12-1

Miscellaneous.

A JOBBING HOUSE OF PLUMBING supplies located in a southern city of 125,000 inhabitants, with well established business, will sell one-half interest; this is a fine opportunity for the right man. Address 596, "Domestic Engineering," Chicago. eow

For Sale.

FOR SALE—A WELL ESTABLISHED plumbing, tinning, cornice and roofing business employing at present 50 men; or will consider a competent mechanic as prospective partner; located in a city of 65,000 in Central New York. No. 585, "Domestic Engineering," Chicago. tf

Plumbing Schools.

WE TEACH YOU THE PLUMBING TRADE. Pays best wages; insures steady work; makes you independent. Write today. Plumbing School, Minneapolis, Minn. 10-'06

Books.

LADD'S DISCOUNT BOOK. 200 TABLES, 120,000 computations. Covers the whole range of discounts, both simple and complex. Results all figured out for you ready for use at a glance. You need it in invoicing, in setting prices and in making inventories. $4.00. DOMESTIC ENGINEERING, Chicago.

HEATING AND VENTILATING BUILDings. A Manual for Heating Engineers and Architects, by Rollo C. Carpenter, M. S., C. E., M. M. E., Professor Experimental Engineering Cornell University. New and enlarged edition. 562 pp., 277 illustrations. Cloth, $4.00. DOMESTIC ENGINEERING, Chicago.

CONTRACT AND ESTIMATE RECORD Book, for Steam and Hot Water Heating, by B. H. Jessup. A much needed book. Every item for estimates on steam and hot water heating is listed, with parallel columns for entering the cost. Alphabetical index for names of parties to whom estimates are furnished. Accurate, business-like, prevents losses. 200 pp., 7x12 inches. Cloth, $1.50. DOMESTIC ENGINEERING, Chicago.

Mailing List Architects: We sell a tested and guaranteed mailing list of all the 8,000 practicing architects in the United States and Canada for $2.00. Cash with order, please. DOMESTIC ENGINEERING, Chicago.

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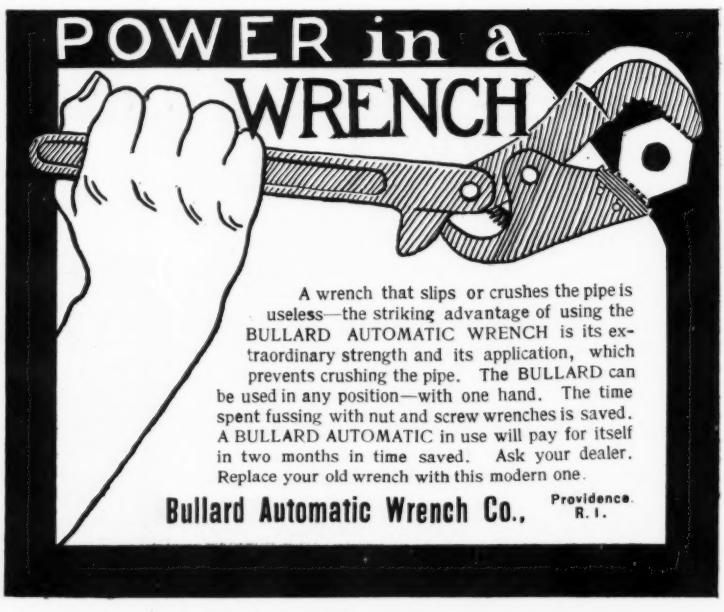
Mailing List Gas Companies: We sell a tested and guaranteed mailing list of the 2,600 gas companies in the United States and Canada for $1.50. Cash with order, please. DOMESTIC ENGINEERING, Chicago.


POWER in a
WRENCH
A wrench that slips or crushes the pipe is useless—the striking advantage of using the BULLARD AUTOMATIC WRENCH is its extraordinary strength and its application, which prevents crushing the pipe. The BULLARD can be used in any position—with one hand. The time spent fussing with nut and screw wrenches is saved. A BULLARD AUTOMATIC in use will pay for itself in two months in time saved. Ask your dealer. Replace your old wrench with this modern one.
Bullard Automatic Wrench Co.,
Providence, R. I.

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No. 78 Hand or Power. Range 2½ to 4 inches. R. H.

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Expansion Bolts.

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Gas Fixtures.

E. BAGGOT CO., 169 ADAMS ST., CHIcago, Ill. Makers of Gas Fixtures and Fittings.

Pipe, Cast Iron.

CHAS. MILLAR & SON CO., UTICA, N. Y. Superior quality Cast Iron Gas and Water Pipe, Cast Iron Soil Pipe and Fittings, Cast Iron Screwed Fittings.

Radiator Bronzes, Etc.

EUGENE ARNSTEIN, CHICAGO, ILL. Maker of Radiator Bronze Powders, Bronzing Liquids and Enamels, specially prepared and specially good. Write for new catalogue.

Pumps.

AMERICAN STEAM PUMP CO., BATTLE Creek, Mich. Makers of Marsh Steam Pumps for hot and cold water.

Traps, Steam.

THE ALBANY STEAM TRAP CO., ALTraps. Practicability and efficiency. bany, N. Y. Improved Return Steam

Water Closets.

THE R. C. McCLURE CO., SYRACUSE, N. Y. Mfrs. of the very highest grade of Water Closets. Send for booklet.

K. V. A. CLOSET TANKS AND SEATS. None better made. Knott-Van Arnam Mfg. Co., Fort Wayne, Ind.

Hot Water Heating Contracts and Specifications

We have for sale a standard specification and contract for hot water heating. It is elastic and suitable for large and small contracts. Printed on good linen paper. Price list, delivered to you:

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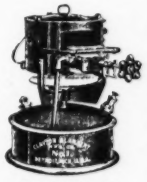
100 copies	3.50
500 copies	10.00

Terms: Chicago or New York draft with order. Sample sent free on request.

DOMESTIC ENGINEERING

58-64 N. Jefferson St., Chicago

Thousands of the world's best mechanics have tested and tried the No. 1 and No. 5 Fire Pots. Their verdict is, "We cannot afford to use other makes if they cost nothing. **We save time—another word for money**—buy less gasoline, and have the satisfaction of knowing that **we are using the best fire pots on earth.**" Why don't you try one? Your money back if you are not pleased. Our catalog is free. Jobbers sell at factory price. Cash must accompany all orders sent to the factory.



No. 1 Fire Pot
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Capacity 7 pints

No. 5 Fire Pot
$4.50 net
Capacity 5 pints

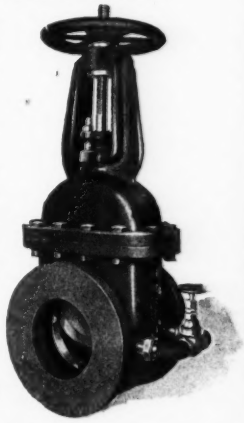
CLAYTON & LAMBERT MFG. CO., DETROIT, MICH.

The Best that Brains and Skill can Produce

from the very highest grade of material, is the style of workmanship represented by the

Kennedy Valve

Every valve is subjected to a high test and rigid inspection before leaving our works. We will be pleased to send you our catalogue.



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Pennie Patent Back Water Valve

The Kennedy Valve Mfg. Co.

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Chicago, Murphy-Dugger-Clark Co. San Francisco, Lally Co. New Orleans, Louis Kaufman. Louisville, E. Morton & Co. Portland, Ore., L. B. Merton.

MENTION DOMESTIC ENGINEERING

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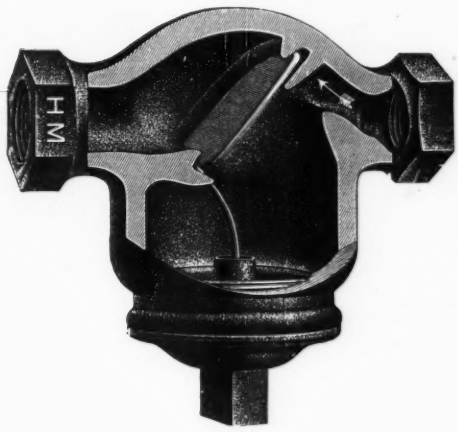
MUELLER WATER STRAINER

PATENTED



C-109

The screen in this strainer not only has good protection against clogging with sediment but is equally well protected against injury from cutting matter the water may carry. All matter first strikes a baffle plate at the inlet and is deflected past the screen direct to the pocket. Made regularly in sizes up to 3 inch and in larger sizes upon order.

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Works and General Offices
DECATUR, ILL., U. S. A.
West Cerro Gordo St.

Eastern Division
NEW YORK, N. Y., U. S. A.
254-258 Canal St. (Cor. Elm)

MENTION DOMESTIC ENGINEERING

"IMPERVIO"
Vitreous China Lavatories

We want to send you a new 32 pp. pocket catalogue just printed showing twenty-nine different styles of "Impervio" China Lavatories. This book will help you to sell goods. Send for it at once.

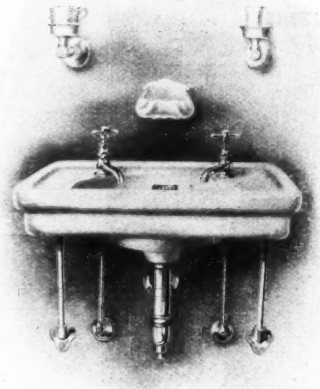

Plate 30-V
All Roll Rim Square Lavatory, "Empire" Design.
Dimensions: Lavatory, 24 x 20 in.; Bowl, 16 x 12 x 6 in.; Apron, 3¾ in. deep. Approximate shipping weight, 110 lbs.

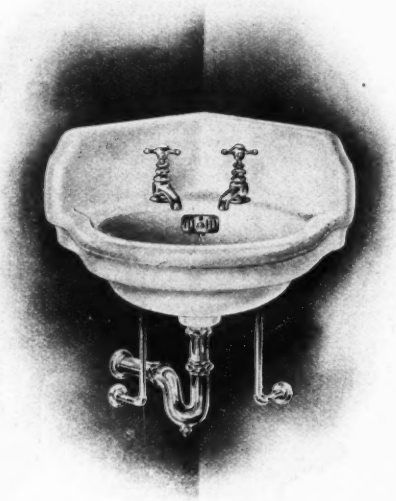

Plate 25-V
Corner Lavatory, "Empire" Design, Set upon Wall Hangers.
Dimensions: Length along Sides, 16½ in.; Height of Sides, 6 in.; Apron, 3 in. deep; Bowl, 14 x 11¼ x 6 in. Approximate shipping weight, 110 lbs.

On every Lavatory, stamped in black underneath the glaze, is our regular *Vitreous China* trade-mark, as shown here:

Hereafter, in addition to this trade-mark, we will, during the manufacturing process, impress underneath the slab near the bowl the following *"Impervio" China* stamp:

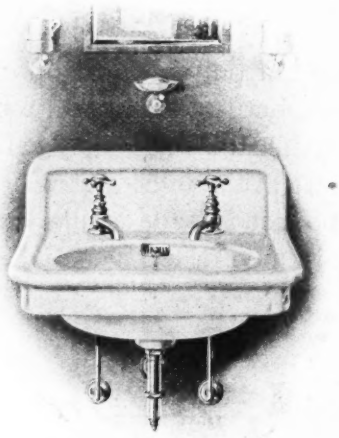

Plate 21-V
"Empire" Design, Small Square Lavatory, with Integral Back.
Dimensions: Width across Back, 20 in.; Front to Back, 18 in.; Back, 6 in. high; Apron, 3 in. deep; Bowl, 15 x 11½ x 6 in. Approximate shipping weight, 110 lbs.

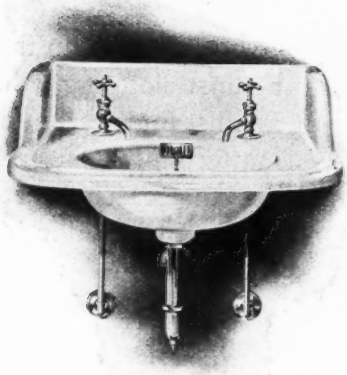

Plate 2-V
"Walker" Square Lavatory, with Integral Back.
Dimensions: Size No. 1.—Length across Back, 24 in.; Front to Back, 20 in.; Back, 3 in. high; Bowl, 15½ x 12 x 6 in.
Dimensions: Size No. 2.—Length across Back, 24 in.; Front to Back, 20 in.; Back, 6 in. high; Bowl, 15½ x 12 x 6 in.
Approximate shipping weights: Size No. 1, 115 lbs.; Size No. 2, 130 lbs.

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Trenton
New Jersey

The Trenton Potteries Company

Main Offices and
Show Rooms
Trenton
New Jersey

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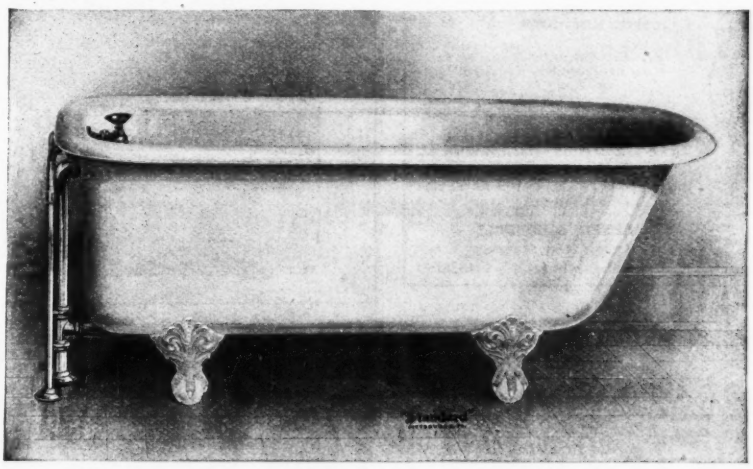
"Standard" Porcelain Enameled Bath

The fixture illustrated below is our "Occident" pattern, which is very popular and is in heavy demand. The feature which has made it so is that it has nearly straight sides, a wide, flat bottom and a large bathing space.

The "Occident" is very reasonable in cost and bears our "Standard" **Green** and **Gold** label, the guarantee of highest quality.



OCCIDENT—Plate P 121

"Standard" Porcelain Enameled Bath, with Wide, Flat Bottom, and Nickel-plated No. 4½ Fuller Double Bath Cock, with ½-inch I. P. Size Offset Supply Pipes and Connected Waste and Overflow with Rubber Stopper.

DIMENSIONS

Width over rim . . 30 inches
Width of roll rim . . . 3 inches
Height to top of rim . 22½ inches
Depth inside . . 17 inches

Nominal sizes	4'	4½'	5'	5½'	6'
Plate P 121 as described	$32.25	$32.25	$35.25	$39.00	$43.50
Plate P 121 A, bath only, drilled for fittings shown	24.00	24.00	27.00	30.75	35.25
Length over rim, bath only	4'	4' 6"	5'	5' 6"	6'
Approximate weight of bath crated	300 lbs.	325 lbs.	350 lbs.	375 lbs.	400 lbs.

Standard Sanitary Mfg. Co.

PITTSBURGH, PA., U. S. A.

IT IS THE LITTLE THINGS THAT COUNT

Like "the Mark found only on good goods."

Canfield

Insist on the "Canfield" trade mark being on the rubber goods you buy. This little bath tub and basin waste washer will last a lifetime. It bears the "Canfield" trade mark.

H. O. Canfield Company, BRIDGEPORT, CONN.

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Electric Triplex Pump without gearing. Designed for use in Apartment Houses, Office Buildings, etc. Noiseless in operation.

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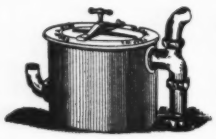

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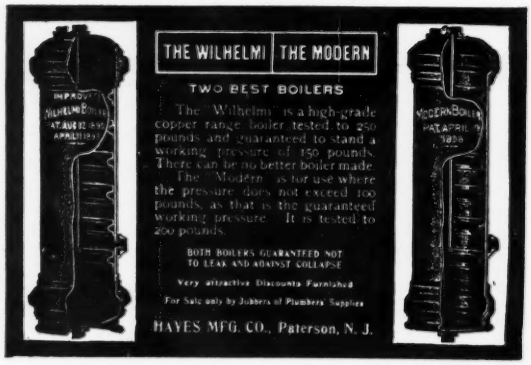
THE WILHELMI
THE MODERN
TWO BEST BOILERS
The "Wilhelmi" is a high-grade copper range boiler tested to 250 pounds and guaranteed to stand a working pressure of 150 pounds. There can be no better boiler made.
The "Modern" is for use where the pressure does not exceed 100 pounds, as that is the guaranteed working pressure. It is tested to 200 pounds.
BOTH BOILERS GUARANTEED NOT TO LEAK AND AGAINST COLLAPSE
Very attractive Discounts Furnished
For Sale only by Jobbers of Plumbers' Supplies
HAYES MFG. CO., Paterson, N. J.

When Making Up Pipe Joints

Use Dixon's Pipe-Joint Compound. It lubricates screw threads, making it easy to tighten up joints. It fills up "chinks" keeping joints tight indefinitely. It never sets but permits joints to be easily opened years after. Get free sample "37-D".

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"Hail to the Chief" Nothing can Stop the Onward March of Radcliffe's "Positive" Anti-Syphon Trap

We propose to make it possible for every subscriber who is a Master Plumber to secure a sample line of these traps below Jobbers' prices, so that you can set them up and test them for yourselves. This is positively the only offer of the kind that will ever be made, and no individual or firm can secure more than one sample order. Detach the Coupon and fill out your order, and send Check or Money Order and we will ship the goods freight prepaid. Make Checks and Money Order payable to The Ohio Brass and Iron Manufacturing Company, Cleveland, Ohio.

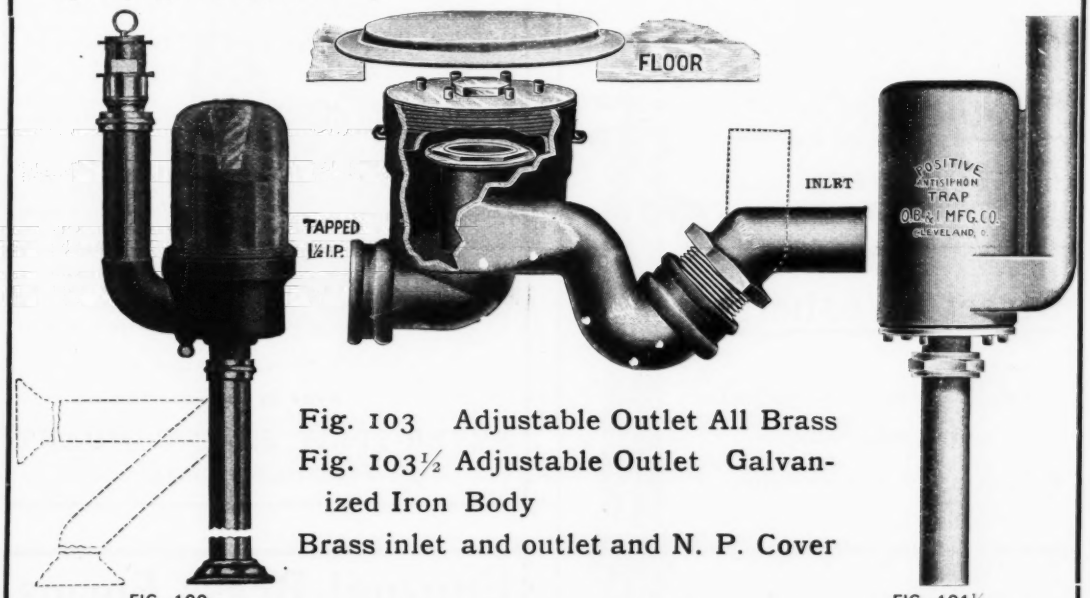

FIG. 100 FIG. 101½

Fig. 103 Adjustable Outlet All Brass
Fig. 103½ Adjustable Outlet Galvanized Iron Body
Brass inlet and outlet and N. P. Cover

When Fig. 100 is used with a glass dome it has a N. P. shield covering glass up to the line of the seal. Fig. 101½ is a lead body with standpipe and male and female cleanout screw of brass, and waste pipe of brass tubing extending to the floor. We also make the ends of these traps threaded to receive a 2x1¼ or 2x1½ brass caulking ferrule; also a brass floor flange with the outlet end threaded for iron pipe 1½ or 1¼ and recessed to prevent obstruction.

Fig. 103 is an all brass bath trap, and Fig. 103½ a galvanized iron body bath trap, and both have a 45° brass solder nipple inlet with a piece of N. P. tubing 6 inches long screwed into the inlet end to form a P trap. The body of the trap fits over the elbow outlet and can be adjusted to any desired angle, and is made tight with a lock nut and lead washer. The inlet elbow is of brass with a wide flange, so that lead pipe can be shouldered up to the recessed end and the joint wiped on flange. The bottom of the screw cap dips into the trap seal one-half inch. N. P. stamped cover is used at floor.

THE OHIO BRASS & IRON MFG. CO., Cleveland, Ohio

CUT ALONG THIS LINE

COUPON

Draw a line through the items you do not want. You can have one each of any or all of those quoted below. The Ohio Brass & Iron Manufacturing Co., Cleveland, Ohio. Enclosed find ——— for $——— for the following Radcliffe's "Positive" Anti-Syphon Traps, which please ship us as per your offer in "Domestic Engineering" of Nov. 10th:

1—1¼,	Fig. 100, A, Brass, N. P., S—offset, Metal Dome,	special price	$4.50
1—1½,	Fig. 100, A, Brass, N. P., S—offset, Metal Dome,	special price	5.75
1—1¼,	Fig. 100, B, Brass, N. P., S—offset, Glass Dome,	special price	4.00
1—1½,	Fig. 100, B, Brass, N. P., S—offset, Glass Dome,	special price	5.25
1—1¼,	Fig. 100, C, Brass, N. P., S or P—straight, Metal	Dome, special price	4.25
1—1½,	Fig. 100, C, Brass, N. P., S or P—straight, Metal	Dome, special price	5.50
1—1¼,	Fig. 100, D, Brass, N. P., S or P—straight, Glass	Dome, special price	3.75
1—1½,	Fig. 100, D, Brass, N. P., S or P—straight, Glass	Dome, special price	5.00
1—1¼,	Fig. 101½, Lead, S or P, special price		3.15
1—1½,	Fig. 101½, Lead, S or P, special price		3.15
1—2x1½	Caulking Ferrule for end of Fig. 101½, special	price	.20
1—2x1¼	Caulking Ferrule for end of Fig. 101½, special	price	.20
1—1½x1½	Threaded Flange for end of Fig. 101½, special	price	.20
1—1¼x1¼	Threaded Flange for end of Fig. 101½, special	price	.20
1—Fig 103½,	Galvanized Iron Body Bath Trap, special		4.15
1—Fig 103,	All Brass Bath Trap, special price	price	3.15
		Total	

How ship. _____

Name and address. _____

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Absence

of Complicated Parts is a **Feature** which appealstoevery Plumber. An additional point of superiority is that the operating parts of

"Total Eclipse" Hydrants and Street Washers

are near the bottom, **below** the **freezing point.**

¶ Freedom from possibility of freezing is also obviated by virtue of outer pipe being what is termed a Dry Pipe, and thus it serves as a **Frost Case.**

¶ Repairs are effected without digging up. "Don't Blame The Hydrant". Oft-times repairs are made with inferior leather.

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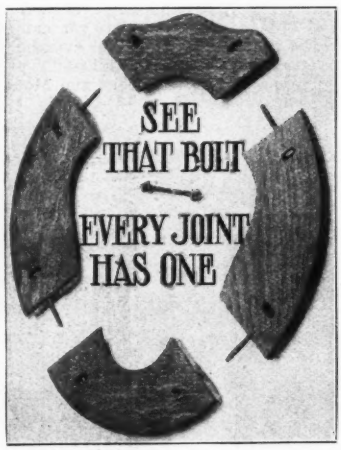


so that they do not show in the finished seat, but in after-years they show by the absence of the usual cracks found in other seats, that they perform a service in seat construction so valuable that it is plainly all-right to advertise the fact that no matter how costly a seat of the "Never-Split" brand you order, it must contain those same, strong iron bolts whose vise like grips make the "Never-Split" Seat the only real "Never-Split".

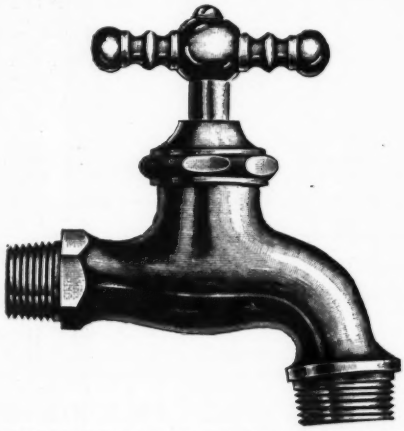
We will send five or more on approval.

Write for Prices.

NEVER-SPLIT SEAT COMPANY

EVANSVILLE, INDIANA

Unusual Brass Forms



Those who value distinctiveness, that quality which characterizes our entire line of brass goods cannot fail to appreciate the advantages over other goods. If you have not yet become acquainted with our goods let us send you samples or catalogue.

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Cleveland, Ohio.

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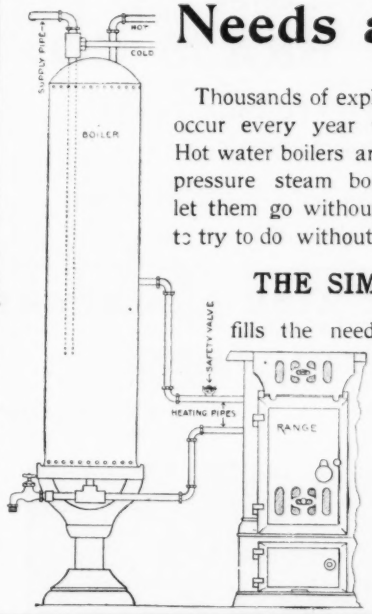
Every House that has a Hot Water Boiler
Needs a Simplex Safety Valve



Thousands of explosions in kitchen hot water systems occur every year with more or less serious results. Hot water boilers are frequently as dangerous as high pressure steam boilers, and it is just as foolish to let them go without safety attachments as it would be to try to do without a safety valve on a locomotive.

THE SIMPLEX SAFETY VALVE

fills the need. It retails for the small sum of One Dollar (Ten Dimes). You can sell lots of them, and your profits are liberal. Write us to-day for Terms.

Patented Feb. 20-' 06.

The Simplex Manufacturing Co.

140 Nassau St., New York City

CHICAGO, 185 Dearborn St. PHILADELPHIA, Boise Bldg. BOSTON, 79 Milk St.

THIS CLOSET
CANNOT FREEZE

THERE is a constant demand for a Closet that will not freeze, but there is only one sure enough frost-proof Closet on the market. Our trap and valve is built below the frost line, and that's is the only sure way to build a frost-proof closet. When in use the valve inlet is held open, and the waste outlet and outlet to the hopper are closed, then forcing the water into the tank, and compressing the air before it, ready upon release of seat, to send a scouring flush, leaving the closet clean and dry. The closet is all finished before it is sent to you.

Send for calalogue. It tells explicitely all about Frost-proof closets, and why ours is "it."

PITTSBURGH BRASS MFG. CO.

PITTSBURGH, PENNA.

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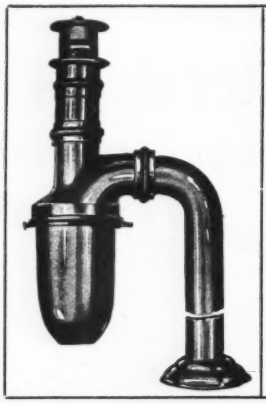

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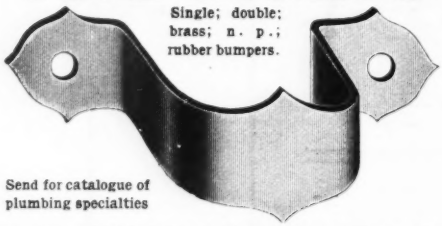

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Sole Manufacturers
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or The Theory and Practice of Plumbing Design in Question and Answer

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Member American Society Inspectors of Plumbing and Sanitary Engineers. Formerly Chief Sanitary Inspector Tenement House Department, New York.

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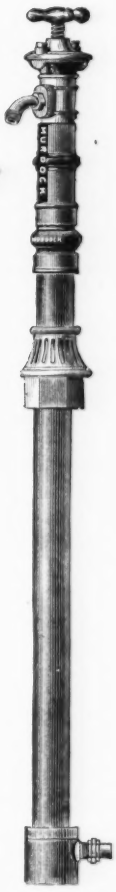

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When ordering Hydrants order the **genuine "Murdock" Hydrants** (be careful to use the FULL NAME) and see that the FULL NAME is cast on the stock.

That is the only way to get the REAL, the ORIGINAL

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PROPRIETORS OF
AMERICAN BRASS WORKS
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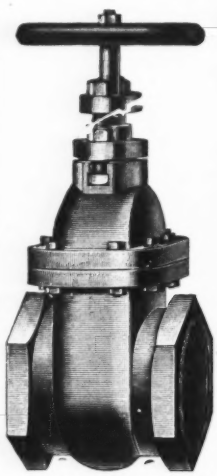

Discs interchangeable. Can be packed either opened or closed. Full weight, first-class material, superior finish.

Made in Brass and in Iron Body, both screwed and flanged. Bell ends. Rising stem and yoke. Standard, medium or extra heavy. For water, steam, gas or oil.

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Every part is accessible from the outside. You will notice also that about 95 per cent of the boiler surface is fire surface, as compared with other boilers, and that the fire travel is fully 50 per cent greater. That's what gets results.

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Akron, O.

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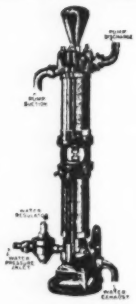

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FOR PUMPING SOFT WATER

Well made. Noiseless. Requires no oil or attention. Is absolutely automatic. Guaranteed to you, to give perfect satisfaction. Write for prices and further information.

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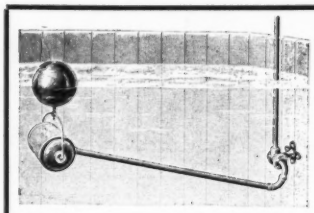

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Clear Clean Water

It draws the water from the top. It cannot draw up the sediment, and the strainer prevents the floating matter from entering. It is used principally in cisterns, wells and tanks. Send for booklet and prices to-day.

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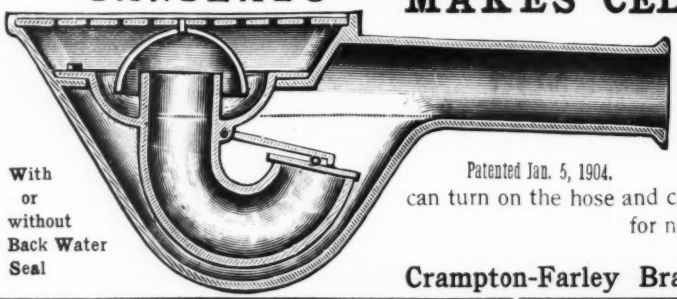

With or without Back Water Seal

Patented Jan. 5, 1904.

Many houses of various nature, residence or business, are unsalable on account of the damage caused by lack of proper floor drainage. With a "Sansealo" drain in the floor you can turn on the hose and clean up in safety. Write us to-day for new Catalogue.

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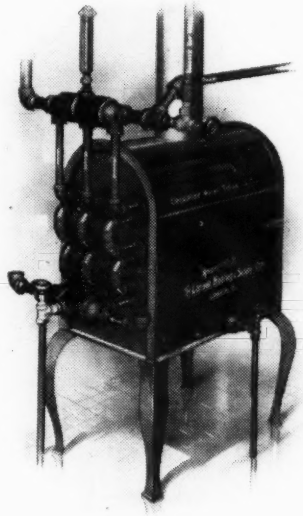

We will pay one hundred dollars for a typhoid germ that has gone through our hot water heater and come out alive. Our only stipulation is that said germ must be brought to at least 212° Fahrenheit while in the heater—but that's easy with the Lorain Heater, which is the fruit of twenty years' experience. We are safe in saying that there is not a hot water heater on the market today that can equal it in efficiency, simplicity and economy.

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CONSUMES GARBAGE HEATS WATER

THE ONLY PRACTICAL DEVICE OF ITS KIND

For Apartment Buildings, Hotels and all Institutions where burnable refuse accumulates and where lots of Hot Water is used. Costs less to operate than any other kind of Water Heater or Garbage Burner.

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Write for Prices.

We Ship Promptly

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Laundry Trays

PRONOUNCED OR
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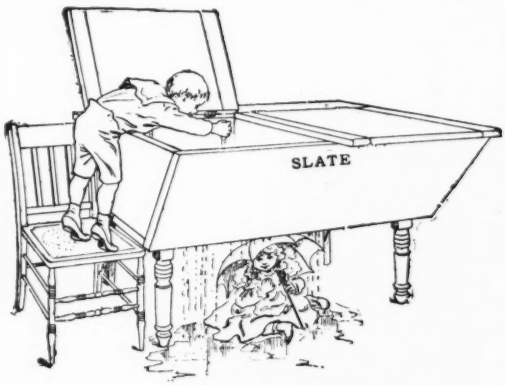

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TO THE FRONT BECAUSE THEY ARE

Built Right—Look Right—Work Right

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Hand made full saddle seats on every closet, and when wanted can furnish seats to rough in at eight inches on WD—Ten on Syphon Jets.

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Are now installing in every Hamilton Gem Tank the **Reliable Ball Cock**, a recent patent, and we challenge the world to produce its equal. All pressures from 1 lb. to 250 lbs. look alike to it, no cup leathers, no close working parts, leverage 100 to 1, is the only compound supply valve made where the plunger is centered with a pin on the bar, seats square and true every time, has removable seat plate of phosphor bronze. Reliable Ball Cock can be used for repairs in any make of closet, high or low, for we make the thread, coupling and tail piece of the stem all sizes, just mention the size coupling or the name of closet you want it for. Haven't had a single adverse criticism on the **Reliable Ball Cock**, each mail brings us duplicate orders and words of contented satisfaction from Mr. Plumber.

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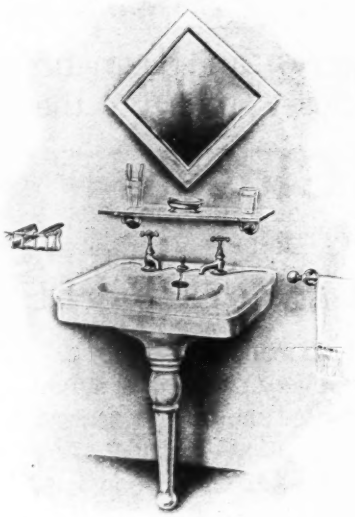

Plate 18-A

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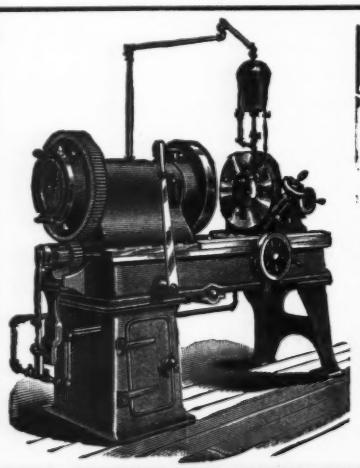

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We also make Erie Pipe Hangers, Erie Malleable Unions and Malleable and Gray Iron Pipe Fittings.

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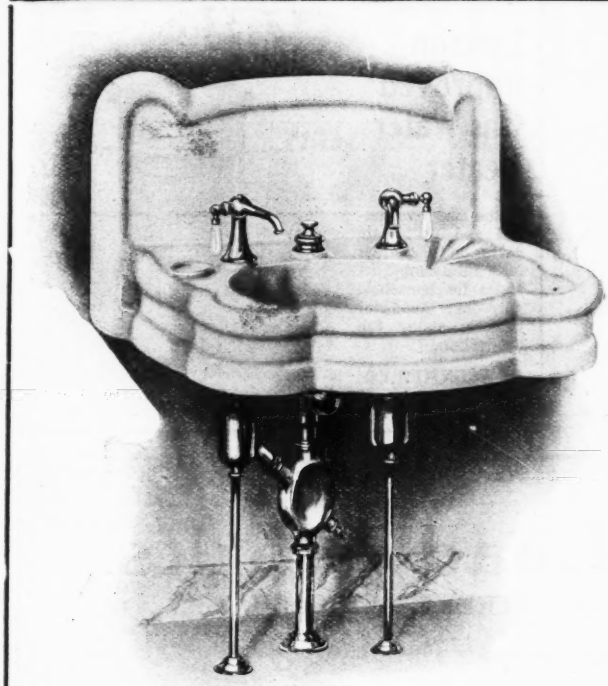

THE LEADING JOBBERS of the United States and some foreign jobbers have written us that our "Southern Beauty" C-68½ lavatory is the handsomest lavatory on the market. We believe it ourselves and think a glance at the cut will convince those who have not seen it.

PLATE C-68½ (WITH BI-TRANSIT WASTE)

Made in two sizes	LIST
20 in. x 24 in.	$23.00
22 in. x 27 in.	27.00

We also make this design with overflow strainer and plug; plate number is C-68, and lists are $3.50 less than above.

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Porcelain Enameled Iron "Waldorf" Pattern Lavatories

Slab, Basin and Apron Cast in "One Piece"

All over enameled on Fluted Elipse Pedestal and fitted with N. P. Brass "Superior" Fuller Faucets with "H. & C." Handles, Secret Waste with China Index, "Bottle" Trap with Vent to Wall and Straight Supply Pipes to Wall.

DIMENSIONS	Elipse Slab	American Basin
Plate K 171 P -	24" x 34"	14" x 18"
Plate K 169 P -	20" x 28"	12" x 15"

PRICES	Lists
Plate K 171 P—Complete as described - -	$49.50
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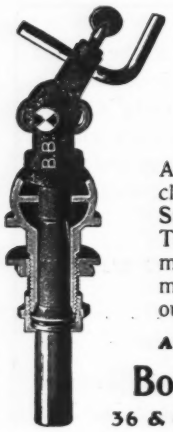
The "Waldorf"



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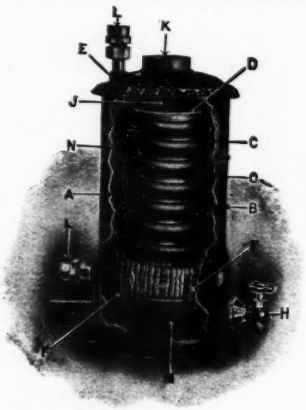

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IRON CLEANOUTS

A trap screw ferrule combined with any style of soil pipe fitting

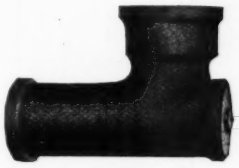

Figure 1

Figure 2

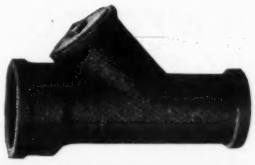

Figure 3

Figure 4

Figure 5

THIS style of cleanout has the advantage over the old style combination of being a one piece job. They do away with the caulking in of iron trap screw ferrules, are more lasting and sanitary, and take up less room than the old style fittings. Altogether they make a better job for less money.

WE MANUFACTURE THE FOLLOWING FITTINGS IN ALL SIZES FROM 2 INCH TO 6 INCH:

Figure 1. Combination TY and cleanout.
Figure 2. Combination T and cleanout.
Figure 3. Combination Y and cleanout.
Figure 4. Combination Y and cleanout.
Figure 5. Combination Y and ⅛ bend and cleanout.

The above are supplied with brass trap screw and can be furnished with threaded brass sleeve, if desired.

CATALOGUE "B"

Our catalogue of cast iron soil pipe fittings, plumbers' iron work, service boxes, valve boxes and miscellaneous castings is just off the press and shows our line of Iron Cleanout Fittings with list prices.

Discounts furnished on application

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CENTRAL FOUNDRY CO.

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LUDLOW

Gate Valves
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MANUFACTURED BY

PITTSBURGH MFG. CO.

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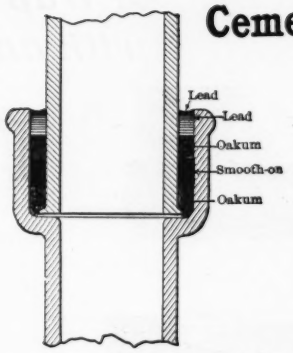
SMOOTH-ON

TRADE MARK

Iron Cement

For Soil Pipe



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It is used by hundreds of Master Plumbers who want an efficient Cellar Drain at the *right price*.

Sturm Cellar Drain

To allow water to flow off just unscrew the plug. To prevent entrance of back water or sewer gas screw it back in again

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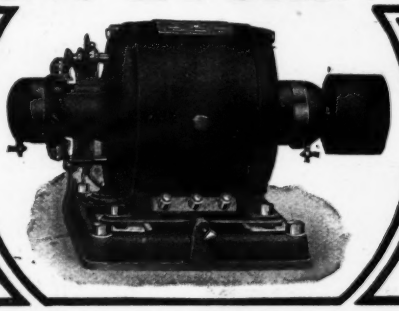

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PRICE IS LOW

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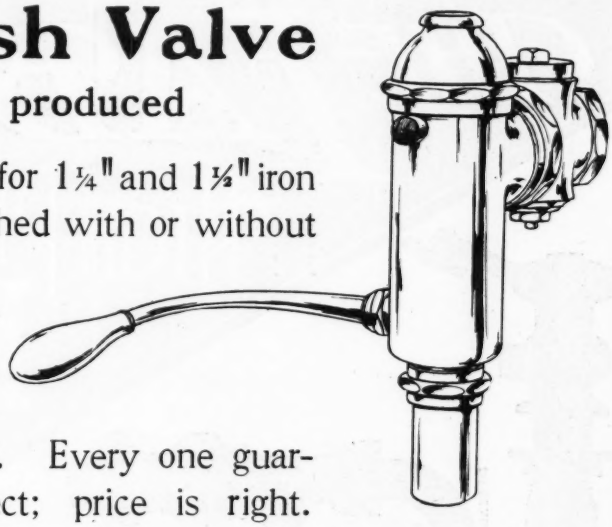
Novio Flush Valve

The Best yet produced



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There is no need of a vent pipe. Back venting hastens evaporation and oscillation.

A 1½-inch Trap with a 2-inch seal of water, when vented, evaporates in 14 days. An unvented Trap takes 60 days to evaporate, with the same seal.

The water in the "PROTECTOR" Trap is driven through the body by hydraulic and atmospheric pressure, instead of being pulled through by suction.

ADVANTAGES.

It is self-cleaning.

It has a 3½-inch Seal of Water, which is retained at all times.

Fig. L-2820

Fig. L-2821

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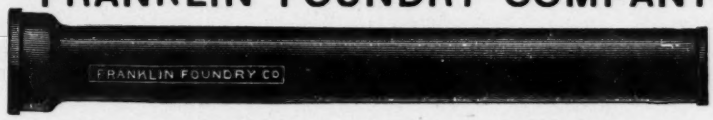

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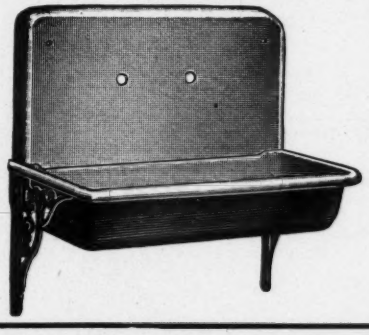

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The "CAMPBELL"

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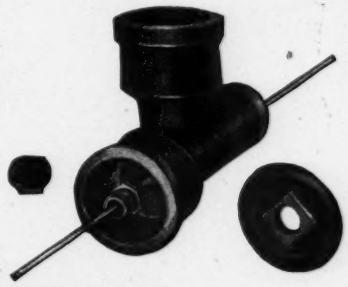
Clean-Out Fitting

Why be behind the times when you can be up-to-date by using "CAMPBELL" CLEAN-OUT FITTINGS, the special features of which will interest you. They are



A—trap screw clean-out
A—continuous soil pipe fitting
A—test plug, and drain connection—
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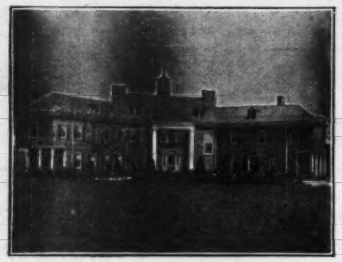

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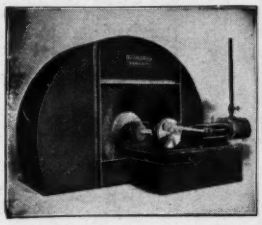

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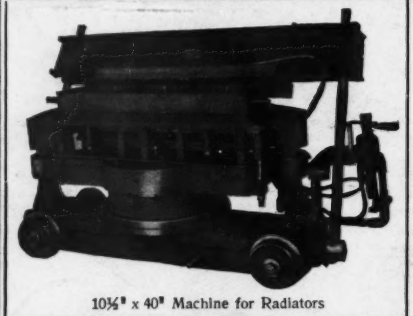

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